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MILITARY MEDICINE

ORIGINAL ARTICLES

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Recent Advances in Immunization in the Armed Forces*

By

GEOFFREY EDSALL, M.D.

Director, Immunology Division, Army Medical Service Graduate School, Walter Reed Army Medical Center, Washington 12, D.C.

AND

Director, Commission on Immunization, Armed Forces Epidemiological Board

(With two charts)

SINCE time immemorial man has been seeking ways to escape from pestilence. Aside from magic and incantations, he has sought escape by bottling up the sources of infection (quarantine); by getting away from known infectious areas—as the Romans did in their hillside villas; by acquiring immunity (as through inoculation against smallpox); and by dietary restrictions, as in the Hebrew food laws. Our modern concepts of infectious disease control have not changed in principle as much as we may sometimes think, but our horizons have expanded, our understanding of what we are trying to do has immeasurably increased, and our technical abilities have revolutionized the entire field. Yet, in at least two respects we still fall far short of our goal. In the first place, despite our present knowledge of sanitation, a very large portion of the world remains unsanitary, and hence unsafe for those who are not adequately protected by such means as immunization. Secondly, our knowledge of the mechanisms and principles of immunization still has many deficiencies and limitations. One must of course acknowledge a few outstanding successes. Yellow fever vaccination is almost flawless in its effectiveness, and smallpox vaccination, properly carried out, is still one of the wonders of civilization. But the success of each was due to an accident, and it is discouraging to realize that all our efforts to date have not produced any other accidents as superbly successful as these two. This is not for lack of trying; it probably is basically because we do not yet understand the fundamentals of the immune process. Where we do have some understanding, we find, as it unfolds, that it is far more complex and elusive than the pioneers in immunology dreamed. One need only consider tuberculosis, with its numerous controversies: What is the relation of allergy to immunity? Does a primary infection really protect against secondary or recurrent infections? Is vaccination actually of value, or are we merely deceiving ourselves with a test (the tuberculin test) that is not to the point, and with statistics that fail to yield a clear, unequivocal answer? What of the common cold, or bacillary dysentery, of malaria, of hepatitis, of dermatophytosis

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—all of them infectious diseases, and yet none of them yielding, as yet, to the methods of control which we immunologists describe so smoothly and so neatly in our courses and our textbooks?

I do not propose to present any final or even semi-final answers to these or similar questions today, for I have none. However, I do feel that a few comments on the efforts of the Armed Forces to solve some of the existing problems of immunology may be of interest. These efforts are considerable, and they are directed by an able and experienced group of scientists. First, however, let us take a brief look at the point from which we start. Of the ten major causes of days lost during World War II, eight were essentially infectious in origin. And it happens that we have no current standard immunization procedure for any of them. Table I summarizes the standard immunization procedures of the United States Army about ten years ago. The essentials of it are familiar to all of you. Table II shows our present standard immunization procedures, and you will note a few changes:

1) Typhoid-paratyphoid (TAB) vaccine is now given in 3 doses of 0.5 ml. each.

2) TAB vaccine may, optionally, be given (as a booster dose) intradermally. This option, however, is relatively little used.

3) The booster interval for TAB, in the continental United States and similarly safe areas, has been lengthened to 3 years (largely due to the present efficacy of chloramphenicol).

4) Initial tetanus immunization is now given with 2 doses of alum toxoid instead of 3 doses of fluid toxoid. Let us give full credit to the Navy for establishing the practicability of this procedure.

5) The tetanus booster interval has been standardized at 4 years, and the 1 year dose is now explicitly regarded as part of the basic course.

6) The yellow fever booster interval has been extended to 6 years. This is hardly an outstanding series of changes! But the story as shown here is not actually complete, and besides, many studies are under way—some almost at the point of fruition, some actually in effect—which point toward major improvements in our immunological bastions against invasion.

For example, one story not shown here is that of influenza. Table III summarizes the history of our experience with influenza vaccine during the first five years of its use in the Armed Forces. After the outstanding successes of the first four years, the jolting failure of 1947 actually led to a better understanding of the problem than anyone had had before. This is not the place to go into details regarding the changing antigenic patterns of the influenza virus, but suffice it to

TABLE I

IMMUNIZATION IN U.S. ARMY—1943

Disease	Basic Schedule	Booster Schedule	
		Amount	Interval
Smallpox	1 cap.	1 cap.	3 yrs
T-A-B	0.5, 1.0, 1.0 ml	0.5 ml	1 yr
Tetanus	3×1.0 ml	1.0 ml	1 yr and on injury
Diphtheria	0.1, 0.5, 1.0, 1.0 ml Schick, if feasible	usually none	
Yellow Fever	0.5 ml	0.5 ml	4 yrs
Ep. Typhus	2×1.0 ml	1.0 ml	2 per yr
Cholera	0.5, 1.0 ml	1.0 ml	4–6 mos
Plague	0.5, 1.0 ml	1.0 ml	6 mos
Influenza	1.0 ml	as indicated	

TABLE II
IMMUNIZATION IN U.S. ARMED FORCES—1953

Disease	Basic Schedule	Booster Schedule		
		Amount	Interval	
			USA	Overseas
Smallpox	1 cap.	1 cap.	3 yrs	1 yr
T-A-B	3×0.5 ml	0.5 ml s.c. or 0.1 ml i.d.	3 yrs	1 yr
Tetanus	3×0.5 ml (3rd dose at 1 yr)	0.5 ml	4 yrs	4 yrs
Diphtheria	for Schick positives, 0.1, 0.5, 1.0, 1.0 ml	0.1 ml	—	5 yrs
Yellow Fever	0.5 ml	0.5 ml	—	6 yrs
Typhus	2×1.0 ml	1.0 ml	—	1 yr
Cholera	0.5, 1.0 ml	1.0 ml	—	6 mos
Plague	0.5, 1.0 ml	1.0 ml	—	4–6 mos
Influenza	1.0 ml	as required		

say that we are now in a position to keep fairly well abreast of changes in the virus as they may occur, and our prospects of controlling the next outbreak are improved accordingly. The results from one of the 1950 studies, shown in the table, are fairly typical of the trials of the last few years.

Less dramatic but nevertheless of genuine promise have been developments, both at the Army Medical Service Graduate School and in the hands of the groups working through the Armed Forces Epidemiological Board, which have moved with varying degrees of success toward the control by immunization of certain arthropod-borne encephalitides, dengue fever, and other virus infections. In the space available, however, I can discuss the subject at hand best by limiting my talk to a few of the problems with which I have been personally concerned, first as an investigator sponsored by the AFEB and for the last 3 years as a member of the staff of the AMSGS.

TABLE III
INCIDENCE OF INFLUENZA
In vaccinated vs. unvaccinated persons

Year of Study; Reference	No. Vaccinated	No. Unvaccinated	Attack Rate	
			Vaccinated %	Unvaccinated %
1943[1]	6,263	6,211	2.22	7.11
1945[3]	600	1,100	1.15	9.91
1945[3]	550	1,050	0.5	12.5
1947[4]	10,328	7,615	7.19	8.09
1950[5]	2,596	2,628	0.5	1.9

To begin with, diphtheria. This disease has been at the least a minor nuisance, and at times a major concern of the Armed Forces. This is in part because the disease has largely disappeared from the American scene, while at the same time artificial methods of establishing and maintaining immunity against it have not been widely and successfully enough employed to replace natural immunization. Thus there were over 2000 cases of this disease in American troops in Germany during 1945. The story of what has happened to diphtheria in the United States of America is briefly illustrated by the data in Table IV. These figures from Massachusetts[6] are typical of what has gone on in many parts of the country in the last 50 years. This dramatic fall in the incidence of cases has been paralleled by a major decrease in the frequency of the carrier state. With fewer cases or carriers, fewer exposures occur, and the development of natural immunity is delayed or may not

TABLE IV
DIPHTHERIA IN MASSACHUSETTS

Year	Cases	Rate*	Year	Cases	Rate
1900	12,641	450.6	1942	154	3.6
1905	5,781	191.7	1943	140	3.2
1910	7,390	218.6	1944	229	5.3
1915	9,282	250.8	1945	194	4.3
1920	7,513	193.6	1946	439	9.6
1925	4,482	107.8	1947	433	9.4
1930	3,322	78.1	1948	290	6.3
1935	390	8.9	1949	333	7.1
1940	144	3.3	1950	135	2.9
1941	123	2.8	1951	90	1.9

* per 100,000

occur at all. Some years ago Wade Hampton Frost[7] calculated that the ratio of carrier infections to actual clinical cases of diphtheria was sometimes as high as 40 or 50 to 1; and that the ratio of persons becoming naturally immune, to those who develop the disease was between 5 to 1 and 15 to 1. Hence the process of developing natural immunity apparently came about, not through *one intense exposure* to the antigen, but through *numerous, small repeated exposures.* This principle has not only been found to be of increasing importance in planning artificial immunization against diphtheria and other diseases, but it probably holds for natural immunization in many other instances too. It is, of course, the principle of the *booster dose.*

A simple example of the booster principle has been provided by the studies of Evans and his associates,[8] working in England with tetanus toxoid. It is shown in Figure 1. The antitoxic advantage gained by the group which received the "booster" dose at 11 months is so obvious here that it needs no further discussion except to point out its bearing on our present policy of a "3rd dose" at 1 year. We have applied this booster principle to diphtheria immunization in the Armed Forces, at the same time that we found it imperatively necessary to determine the smallest dose of toxoid that we could use in this way. By immunizing medical students with decreasing doses of toxoid, we found that the amount of antibody formed did not decrease as rapidly as the dose could be lowered.[9] From the data we obtained it was possible to deduce that the ratio:

$$\frac{\text{Change in dose of toxoid}}{\text{Change in size of antibody response}}$$

was about like that of a square-root relationship, e.g. to get a 3-fold increase in the antibody rise one had to give 9 times as much toxoid. This information proved useful later. Next we found that *1 Lf unit* of toxoid, whether fluid or alum-precipitated and whether mixed with tetanus toxoid or unmixed, gave a good response. This dose was selected on the basis of studies at Fort Knox[10] which indicated that 1 Lf (about 1/10 to 1/15 the standard pediatric dose) was about the most that could be given in one dose without Schick testing if one wished to avoid causing undue reactions in an adult.

Next, in a study carried out at Great Lakes Naval Training Center, we observed the results of 2 and of 3 doses of 1 Lf of toxoid. Table V shows that a group of recruits that were 41% susceptible prior to inoculation were about 9% susceptible after two doses, whereas shortly after the third dose only 1 man out of 252 was still not immune to diphtheria. And this was accomplished with less than one-tenth the usual dose of toxoid. The next step was to try this schedule in a combination, "contaminating" the standard tetanus toxoid, as it were, with diphtheria toxoid. The results were essentially the same as before and reactions were minimal.[11] These findings were then successfully checked at Lackland Air Force Base and at Fort Dix.[12] Consequently, the Armed Forces have this year adopted the policy of combining diphtheria and tetanus toxoids, giving the combination as though they were tetanus toxoid; and (as soon as sufficient time has elapsed to establish basic immunity in the recruits) the present form of diphtheria toxoid will be discontinued.[13] This represents a major step forward, of a practical nature, in the immunization program of the Armed Forces, and it raises the

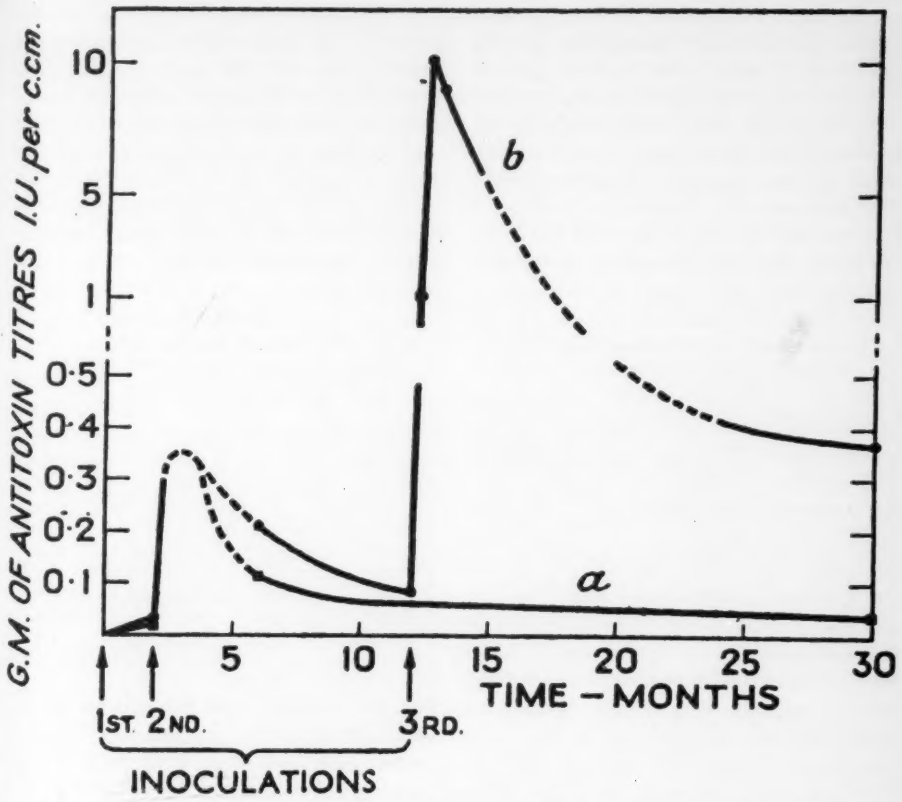

FIG. 1. Tetanus antitoxin titers in the blood of persons receiving (a) two doses and (b) a third dose, of fluid tetanus toxoid (from Evans. ref. 8, by permission).

question: Can we not combine other immunizing agents with diphtheria and tetanus toxoids, and thus further reduce the inconvenience, expense and mechanical cumbersomeness of the present immunization procedures? Some may quail at the prospect of being given "one large jumbo shot with everything in it." However, the Canadians are already one good stride ahead of us, having combined the two toxoids with typhoid vaccine several years ago;[14] and we have, in fact, already begun studies on this possibility ourselves, through the cooperation of Dr. J. Ipsen of Boston, Comdr. John R. Seal (until recently at Great Lakes), and my colleague Dr. M. Landy.[15]

TABLE V

RESPONSE TO 2 AND TO 3 1-Lf DOSES OF ADSORBED DIPHTHERIA TOXOID

Immunity Status	Pre-inoculation	Before third dose	After third dose
Susceptible	103	23	1
Transitory Immunity	67	20	1
Solid Immunity	82	209	250

A question continually raised since tetanus immunization was instituted in the Armed Forces is: How long will it last? Several studies on this point have been carried out, in each case employing veterans as the subjects. Dr. Turner of Hopkins published one last spring,[16] and one which colleagues of mine carried out with me in Bos-

ton, reported briefly in 1953,[17] is summarized in Table VI. It would appear that the durability of tetanus immunity is greater than our fondest hopes had led us to expect.

A few points about adjuvants: Several adjuvants have been quite successful. The oldest of those is alum. A more recently developed one is a water-in-oil emulsion developed by Freund of New York.[18] With this preparation Dr. Freund has found that typhoid antibodies in rabbits reach much higher levels than can ordinarily be achieved, and the antibody titers remain elevated far longer than was ever obtained by the standard type of vaccine. Salk and his associates have done much the same thing with influenza vaccine, finding that an adjuvant vaccine produces antibodies averaging 10-50 times higher than the standard type vaccine.[19] The possibilities of such preparations are, of course, tremendous; it only remains to establish that they can be used regularly and in large groups without causing undue reactions.

TABLE VI

TETANUS ANTITOXIN TITERS AS RELATED TO INTERVAL SINCE LAST BOOSTER DATE: 144 WW 2 VETERANS

Years since last Toxoid	No. in Group	Geometric Mean Titer; Standard Deviation
8–10	36	0.38 ±.14
7	41	0.315±.13
4–6	47	0.27 ±.135
1–3	20	0.48 ±.15

Next, I would like to speak of typhoid fever. Despite the fact that we have used typhoid vaccine for 50 years, there has never yet been a critically controlled study of its efficacy. To be sure, there have been various situations which appeared to provide evidence of its value. A few of these are summarized in Table VII. However, each of these —and many others of the same sort—has its flaws. Furthermore, recent experience of the British in the Middle East suggested that typhoid vaccine, as used there, was of relatively little value.[24] Therefore we have instituted various studies, and helped to foster others, not only to evaluate typhoid vaccine but to develop a better vaccine. It would be impossible here to more than mention the long series of closely planned and successfully prosecuted studies which Dr. Landy and his colleagues have performed, on the production of what appears to be a more potent typhoid vaccine,[25] on the isolation and testing of the antigens of the typhoid bacillus,[26, 27] and on many related studies (e.g. Ref. 15). Much progress has been made, but all of it still hinges on a valid method of evaluating what we have got. Therefore our major emphasis at present is on the study of immunity in typhoid fever in primates. One phase of this, not carried out by our group but undertaken with our cooperation, is a controlled field study of typhoid vaccine in Yugoslavia. I went to Yugoslavia last Fall as a consultant for The World Health Organization and a public health group in that country, headed by Prof. Hinko Emili of the Central Institute of Hygiene in Zagreb, have initiated a splendid field study which already appears to be yielding results of significance. The findings are still preliminary, but it looks as though useful results might be available some time in 1955.

TABLE VII

INCIDENCE OF TYPHOID FEVER
In vaccinated vs. unvaccinated persons

Year Reported; Reference	No. Vaccinated	No. Unvaccinated	Attack Rate	
			Vaccinated %	Unvaccinated %
1913[20]	10,378	8,936	0.54	3.2
1915[20]	—	—	0.095	1.03
1943[21]	4,000	800	1.4	7.0
1944[22]	170	531	4.7	11.5
1946[23]	180	194	0.5	8.7

Our own efforts[28] have been focussed on the possibility of establishing typhoid fever in chimpanzees, as was reported 40 years

ago by Metchnikoff and Besredka.[29] Very briefly, we have succeeded in so doing (Figure 2). Along the way we have observed the carrier state, subclinical infection, and a histopathological picture so typical that one of the resident pathologists, who did not know what he was supposed to look for, recognized it at once as typhoid fever.* Also, we have protected chimpanzees against this infection with typhoid vaccine (Table VIII). The results are still quite tentative, since the vaccine in this experiment was given every possible chance to succeed. However, we now have hopes that, within two or three years, we may be able to say not only whether typhoid vaccine is effective but what vaccine is best, whether isolated and purified antigens are effective, and whether these antigens can be successfully combined with other immunizing agents.

I have said nothing of the fundamental studies on immunization which are being pushed forward by my colleague Dr. E. L. Becker, of the work on gas gangrene antigens and enzymes which we are about to start at the newly built Biologics Research Laboratories in Forest Glen under my colleague Dr. R. B. Gochenour, or of the distinguished series of studies carried out by my many outstanding colleagues of the Commission on Immunization. The latter group has made tremendous contributions to the basic and applied knowledge of immunization against plague, cholera, gas gangrene, mumps, typhoid fever, tetanus and

* Col. Helmuth Sprinz, MC, Chief, Pathology Section, Walter Reed Army Hospital, has carried out all the histopathological studies mentioned here.

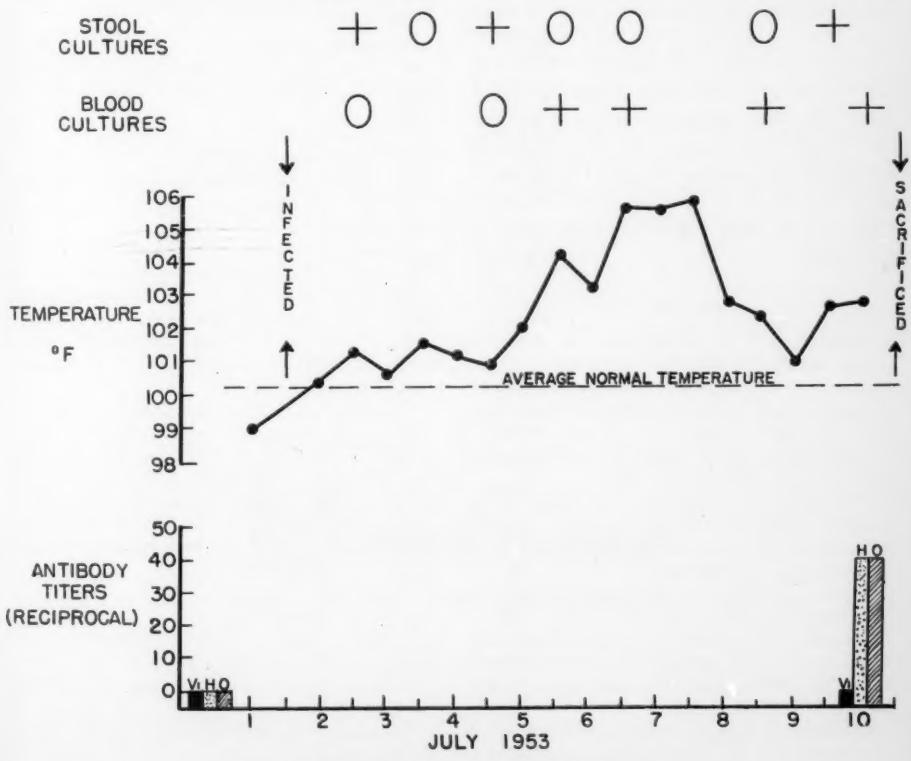

FIG. 2. Experimental typhoid fever in chimpanzees. Chimpanzee No. 1 (Mary)

TABLE VIII

VACCINATION OF CHIMPANZEES AGAINST TYPHOID FEVER

Chimpanzee Group	Number of Animals Showing				
	Positive Blood Cultures	Fever	Symptoms	Antibody Rise	
				O & H	Vi
10 vaccinated	0	1 (?)	0	0	0
7 controls	5	5	4	7	4

other diseases. A mere summary of what they have done would require a morning. In addition this group constantly provides a pool of new ideas, well seasoned with concrete factual data, such as are an essential basis for progress in this field. The progress that we make in the succeeding years will ultimately depend upon our ability to count upon the individual and joint efforts of many of our colleagues; for the field is now far too complex for any one man to encompass. We are fortunate in the fact that the Armed Forces have been able to interest so many able men and women in this work, and it is to them that we must eventually look for the long range progress which is our goal.

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The Use of Cortisone in Treatment of Chorio-Retinal Damage Resulting from Observation of Atomic Detonation*

By

ARTHUR L. CHAMBERS 2D, M.D.†

MANY ocular conditions have been recognized as having been caused by radiations of almost all phases of the electromagnetic spectrum. Indeed, as Cogan[1] stated, "With the exception of radio waves at one end of the spectrum and cosmic waves on the other, there is no type of radiation which has not at some time induced an ocular lesion." Many of these are encountered in the everyday course of events, especially with newer occupations and newly developed industrial methods, plus the greater application of radiant energy in household appliances. Others of these ocular lesions have, of necessity, been produced only experimentally, since the conditions for their production are not encountered under ordinary circumstances.

Those electromagnetic radiations responsible for ocular effects and/or damage are divided into the following common classifications (from short to long wave lengths): Gamma rays, X-rays, Grenz rays, Ultraviolet light, Visible light, short Infra-red rays, long Infra-red rays, and Diathermy.

The lesions produced by these radiations which are more frequently encountered in different portions of the ocular tissues are photophthalmia, snow-blindness, electric retinitis, glass-blower's or bottle-maker's cataracts, X-ray or Roentgen-ray cataracts, radiation cataracts, welder's flash, flash burn, actinic keratitis and sun-lamp keratitis, to use some of the various common names given to these conditions.

The more uncommon lesions, produced by natural sources are eclipse blindness and lightning keratitis. The rarity of each of these is accounted for easily, since for the former there must be a voluntary desire to stare at the eclipse, or more accurately, at the sun, and in order to get subjective clinical data on the latter type, the person must have his eyes open, in the direction of the flash, be in extremely close proximity to the flash, at the time the lightning bolt strikes, and most important, live to tell about it.

The case being reported at this time is one resulting from direct observation of the detonation of an atomic bomb, which cause we might consider, I hope, as one of the more uncommon sources of electromagnetic radiations. This case, in a certain sense, also fulfills certain criteria of the previously mentioned uncommon ocular lesions; namely: a voluntary desire to stare at the blast, with the eye open, at the exact instant of the detonation, and live to tell about it. Although there were undoubtedly some survivors of the atomic blasts over Nagasaki and Hiroshima who may have fulfilled these criteria (as shall be mentioned later), this case is believed to be unique in that cortisone (Compound E), which was used for the treatment, was not commercially available at the time of the blasts in Japan (1945).

Case report: The patient was a well nourished, well developed, white male in no acute distress when admitted to a United States Army Hospital installation His chief complaint was that there was a large central black spot spoiling his vision in the left eye. He stated that 3 days previously, in the pre-dawn hours, he had been present at the detonation of an air-burst atomic bomb in the 1952-53 series, and had directly observed the blast with an unshielded, unpro-

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† Assistant Surgeon, N.Y. Eye and Ear Infirmary; Assistant Attending Ophthalmologist, Yonkers General Hospital; formerly Captain, MC, USAR, on active duty.

tected left eye while in a trench a little over 2 miles from ground zero (the hypocenter). He went on to say, "I saw the actual blast, and I still see it—same shape and everything, but it's black instead of white." Sunlight now caused some annoyance only due to its indistinct brightness, and not because of any true photophobia. There were no other symptoms reported, such as tearing, blepharospasm, or pain, nor could questioning elicit any symptoms of transient complaints which might have subsided prior to hospitalization.

Complete physical examination was within normal limits with the exception of the eye findings and a slight obstruction of the nares with injected nasal mucous membranes. Sinus X-rays were taken due to a history of a "chronic sinusitis," but were normal.

Ophthalmological examination: Vision in right eye 20/15 − 1, and normal in all other respects. Vision in the left eye was 20/60 + 1 to 20/200, variable and rechecked on several different test-type charts. The best vision was obtained when he deviated the left eye from central fixation. Gross external examination and biomicroscopic examination of the anterior segment (lids, cornea, conjunctiva, anterior chamber, iris and lens) showed no significant abnormalities. Ophthalmoscopically there was a large white, fluffy, active exudative lesion in the macular area, with a small dark central spot which had the color of a hole or a hemorrhage. This small spot was the size of the normal foveal reflex and in the proper position for the fovea. The lesion was 1¼ disc diameters in length, and approximately one disc diameter in height. Its position was apparently ¾ above and ¼ below the foveal area. The retina was not raised, but the exudate per se appeared raised approximately 1 diopter from the normal retinal level. At the margin of the white lesion, vessels could be made out thru the overlying vitreous haze and exudate, but in the central portion of the lesion, the vessels were completely obscured. There was a narrow rim of edema (¼ disc diameter in width) at the superior edge of the lesion. Inferiorly there were small areas of edema shown by concentric elevations in the retina, and a superficial hemorrhage of a flat variety which was not too dense or extensive. Central field examinations, using a white cross 5 inches across with limbs one inch broad for fixation and a 3 mm white test object at one meter, showed a central scotoma measuring 15 cm long and 11½ cm high.

Course in the hospital and treatment: Routine laboratory procedures were done and a pre-cortisone-therapy EKG performed. Patient was placed on a salt-free diet, and placed in a room out of the direct or reflected sunlight, with orders to wear dark glasses if necessary to cut down the amount of direct or indirect sunlight in the room. Topical atropine drops were started in the left eye, and systemic cortisone therapy instituted, 100 mgm IM bid for 7 doses.

On the 5th day of hospitalization, the size of the white exudate had decreased remarkably in the superior one-half of the original lesion, being only ½ its original size. The inferior one-half of the lesion, including the macular area, appeared slightly organized, with some staining seen due to absorbing hemorrhage and possible pigmentation. The edema was subsiding and evidenced by radiating tension lines. Cortisone dosage was reduced to 100 mgm qd. Examination on the twelfth day of hospitalization revealed the following visions:

Without glasses	With glasses	With Pin-hole Disc	With glasses & PHD.
20/80	20/60	20/60	20/60

(Glasses were for correction of a minimal compound hyperopic error found under the atropine cycloplegia.) The cortisone dosage was decreased to 75 mgm qd. Field examination showed the scotoma reduced to 11½ cm long by 9 cm high. Fundus examination revealed the previously white area was now dark yellow and light brown, with resolution of the exudate, and progression of the healing and scar tissue formation. A light patch (yellow in color) was still seen nasally and

temporally above the macula, with the fovea still appearing to have the pin-point hemorrhage and/or hole, as before. There was moderate superficial scarring without noticeable pigmentation inferiorly, with some contractures apparent. Regular diet was resumed, the atropine discontinued and the cortisone reduced to 50 mgm for three days and then further reduced to 25 mgm for a final three days. During this time, and for the remainder of the hospital stay, the vision remained 20/50 — 1 with all of the previously mentioned technics, and the central scotoma showed only minimal and non-reproducible changes.

Three weeks after discharge from the hospital (seven weeks after injury) there were still no changes in the visual acuity and no significant changes in the central field defect. Fundus examination at that time showed an increase in the number of contractures of the retina, with more pronounced, or at least more easily seen, destruction of the choroid and retina, but no increase in the over-all area of the lesion. The small dark spot in the foveal area was still unchanged, and a differential between a minute hole and a minute hemorrhage was still impossible to make clinically. Discharge diagnoses (made prior to a review of the literature) were 1) Chorioretinitis, central, left eye, and 2) Burn, 3rd degree, macula, left eye, both due to atomic illumination.

Systemic cortisone was chosen for the treatment of the central chorioretinitis in this case on the basis of the reports in the current literature and the success which I had with this therapy in the relatively few cases which had been under my care up to that time. The complex theory and mechanism of action of cortisone will not be dealt with in this report. Suffice it to say, it presumably controlled and curtailed the duration of the inflammatory response evidenced by the exudate.

The statement has been made that no direct acute radiation damage to the eye was found in Japan.[2] If the omission of the one case to be cited later is ignored, or the term radiation is qualified to mean only the alpha, beta, gamma, and neutron radiations, and not thermal radiations, this statement is true. In a group surveyed by Cogan,[3] no permanent scotoma were found, although some of the cases claimed to be looking in that direction at the time of the detonation. However, withdrawn from their context, and without accurate definition, it can be understood how some might draw the conclusion that viewing an atomic detonation was not harmful. It is said that an atomic detonation gives off radiations in the electromagnetic spectrum similar to our solar sun. Zorab[4] and Jevons,[5] to mention just two, have reported typical cases of the damage caused by directly viewing the sun, which is considered dimmer than the flash of an atomic detonation. One must also consider the recent reports that the present series of atomic bombs are more potent than those dropped in Japan in 1945.

Verhoeff and Bell[6] have furnished us with an excellent understanding of the "how" and "why" of the action of infra-red radiations on the ocular tissues. Cogan[1] has concisely listed the clinical effects of various radiations on the eye. Salisbury,[7] Duke-Elder,[8] and Verhoeff and Bell[6] have shown us the optics, histology, and histopathology of the manner in which infra-red affects the retina without noticeable effects on the other ocular tissues (with the possible exception of the iris). The last two researchers state as follows: "If the source of light is so small in size that the area of its retinal image is less than that of the pupil, the intensity per unit area, as concerns transmissible rays, will be greater on the retina than on the cornea; therefore the macula is damaged without corneal or lenticular changes."[6] The damage by infra-red radiations is due to the heat conversion of the excessive light energy in the pigment epithelium of the retina and the pigment cells of the choroid, and the subsequent passage of this heat anteriorly to the rods and cones, and posteriorly further back into the choroid.[8]

Flick[9] and Schlaegel[10] have reviewed many cases of victims of radiation sickness, describing the clinical (ophthalmoscopic) picture (Flick), and the histopathologic (Schlaegel) findings in these cases. Schlaegel states that the changes found in the cornea and lens were apparently due to the direct effects of radiation, while the findings in the rest of the eye appeared to be secondary to the systemic condition of radiation sickness. Along with his findings of nodular cellular infiltration of the retina, serous exudation, and fibrin nets on the surface of the retina, he found an invasion of bacilli in two cases, allowing a diagnosis of septic choroiditis. He thereafter presumed such was the diagnosis in three other cases in which no bacilli could be found. Flick also uses the diagnosis of septic choroiditis for the cases presented, which were reviewed by Wilder, but here again there is a mention of soft white exudates found eccentrically in the fundi. He too concludes that the ocular lesions described are directly related to the deficiency in the blood elements, and in no way related to the action of the radiant energy. Tamura et al.[11] have listed hemorrhages in the vitreous as due to the blast effect, but also listed 22 out of 115 patients as ophthalmoscopically having exudates in their fundi, without accounting for their etiology.

It is easily understood how much of the ocular pathology found in these cases could be caused by the severe blood dyscrasia subsequent to the radiation sickness, but I feel that if many of these cases were re-evaluated with the role of infra-red radiation in mind, many could be determined to have had lesions in some areas due only to infra-red in addition to other lesions from the systemic condition.

Oyama and Sasaki[12] have cited one case where the patient was definitely searching the sky for the plane and was looking directly at the blast when it occurred. In this case, the fundus lesions cleared, but a permanent scotoma remained. They are the only others to attribute this retinal damage to infra-red radiation according to my review of the literature.

Conclusion

The principal point of this case report and review of previous reports concerning ocular atomic casualties is to show that without protective glasses (which we have seen used in certain instances by viewers of atomic detonations) there is a definite direct permanent ocular hazard, without waiting for systemic effects to become evident. Also, there is to be considered the possibility that the observer may not be close enough to ground-zero to be exposed to enough radiations to develop radiation sickness, and yet be close enough to be subject to permanent ocular damage.

The second point contributed in this paper has been the opportunity to show the use of cortisone in the treatment of central chorioretinitis resulting from the direct observation of the detonation. I assume that the inflammatory exudative reaction was curtailed and prevented from extending further by the cortisone, and yet the drug could not be expected to bring about the complete regeneration of the area which was thermally scarred.

On the basis of only one case, it cannot be definitely stated that this was the only or the best treatment, but it certainly shows that cortisone therapy, perhaps combined with ACTH therapy initially, should be considered in any further cases.

The present literature apparently contains only one other case of direct thermal lesions of the retina and/or choroid due to atomic detonation.

The lectures to the Armed Forces, Civil Defense groups, and the laity must be revised to stress that permanent, not temporary, ocular damage is possible from viewing an atomic detonation.

Summary

A case of central chorioretinitis due to atomic detonation observation has been presented.

Treatment of the case was carried out utilizing cortisone, which was not available at the time of the previously recorded cases.

The pathology presented by the case is considered due to the thermal radiation factor of the infra-red rays emitted at the time of the atomic detonation.

This case represents the second recorded instance of retinal and/or choroidal damage attributed directly to infra-red radiations (of an atomic detonation).

Permanent ocular damage can result from directly viewing an atomic detonation.

AUTHOR'S NOTE: Since this paper was written, additional findings based on chorioretinal burns produced by atomic flash in animal eyes have been published by Col. Victor A. Byrnes, USAF (MC) et al. This paper is, however submitted in its original form, with necessary deletions on security basis.

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Reflex Sympathetic Dystrophy without Apparent Cause*

By
CAPTAIN PER H. LANGSJOEN, MC, USA
AND
COLONEL EDWARD A. CLEVE, MC, USA

THE purpose of this report is to record two cases of reflex sympathetic dystrophy in young female patients who had considerable psychiatric difficulties and in whom no history of evidence of trauma could be detected.

CASE I

This 20-year old female, WAC, noted the insidious development of aching pain on the plantar surface of the right foot near the big toe approximately July 17, 1952. This pain gradually grew worse, becoming sharp in nature, was unrelieved by heat or elevation, was so severe as to preclude walking, and was associated with a sensation of numbness of the entire right lower leg. On August 1, 1952 she was hospitalized.

On admission it was noted that she continually had her right foot dependent and would not bring it to an elevated position. This situation existed for approximately three weeks or a month. During this period there gradually developed swelling of the right foot without signs of inflammation such as redness or increased heat, but with a rather mottled violaceous color. At this time it was apparent that she would not voluntarily keep her foot elevated and a cast was applied to this leg. When the cast was removed the next morning the entire leg had returned to a normal color and the swelling had disappeared. By constant persuasion she was induced to walk on this foot and the swelling and pain gradually disappeared.

Her marriage problem was discussed and it was decided to allow her one month's leave in order that she might re-establish her marital relations, although from her actions and her husband's, this seemed unlikely. She walked out of the hospital and was not seen until one month later. After being hospitalized for one week by a private physician in Los Angeles, with return of her pain, swelling and blotchy discoloration of the right foot, she was returned to our hospital.

Early in October 1952 the pain was so severe that narcotics were necessary. There was numbness of the leg and vague sensory disturbances. She was seen in consultation by the Arthritis Section, the Orthopedic Section and the Neurology Service and the concensus was that she was suffering from a reflex sympathetic dystrophy of unknown etiology. At this time she received a number of sympathetic blocks which produced warming of the foot but no change in the swelling and pain. She received active psychotherapy procedures without response. Due to the failure of all these methods and the strong suggestion of functional disease, she was accepted for treatment by the Psychiatric Service on November 20, 1952, and received a total of 35 hours of psychotherapy. During this period she verbalized considerable resentment towards her father and her marital status, ventilated much material relative to childhood and adolescent pyschic trauma, but showed no improvement in her right leg. By this time the x-ray showed definite evidence of osteoporosis of the bones in the right foot, most marked in the region of the metatarsophalangeal joints but also present in the tarsal bones.

It was apparent by March 1953 that the results in this female were such as to preclude further duty in the Army and she was consequently separated in March 1953.

Past History and Family History. Her parents were separated when she was 5 years of age. Her father is an electronic engineer,

* Cases reported from Lettermen Army Hospital, San Francisco, California.

who has chronic stomach trouble and is described as a stern, loving, overindulgent father. Her mother is an alcoholic and suffers from migraine. Between the ages of 5 and 14, she alternately lived with her father and stepmother and maternal grandmother, who was described as being domineering and stubborn and at other times like a real mother. Her real mother was remarried to an alcoholic. The adolescent period was characterized by much antisocial behavior, several physically traumatic episodes, including rape and abortion, and a poor school record. When she was 16 she became very interested in religion and changed her sexual habits. To escape the domination of her father and prove her independence, she enlisted in the Army in January 1951. Two months later, after a courtship of one month, she married a young immature soldier. The patient could give no reason for this marriage except to escape from her father and she really had no great desire to return to her spouse.

Physical Examination. Physical examination showed a slight swelling over the superior and middle aspects of the dorsum of the plantar surface of the right foot near the big toe, which was exquisitely tender on pressure. At this time there was no skin discoloration and the dorsalis pedis and posterior tibials were palpable and apparently normal.

Laboratory Data. Initial urinalysis, hemogram, WBC, uric acid, serology and spinal fluid studies, chest x-ray, spine x-ray, and x-ray of right foot were all negative or normal. X-ray of the right foot on October 20, 1952 showed definite deossification of the bones of the right foot, most marked in the region of the metatarsophalangeal joints, but also present in the tarsal bones. This process had increased on x-rays taken January 23, 1953. Deossification was noted to involve primarily the cancellous subarticular portions rather than the shafts. Rorschach and Minnesota Multiphasic tests showed evidence in this individual of a strong masculine tendency in a stubborn, headstrong, immature and hysterical person.

Case II

This 26-year old white female, WAC, was admitted to the hospital for the last time on January 5, 1953, with marked pain and discoloration of the left leg. She gave a history of having similar pain and swelling in the left leg since February 1949, for which she was hospitalized at an Army Hospital for approximately 60 days with a diagnosis of thrombophlebitis. Thereafter she was apparently well until September 1949, when she again developed moderate aching pain in left leg, left arm, and also in the left breast, without swelling or discoloration. These symptoms were chronic in nature and remained relatively unchanged to the present date. In October 1950, this patient was hospitalized again at an Army Hospital for bronchopneumonia. At that time an incidental finding on physical examination was a left sided hemi-hyperesthesia, which the patient stated she was well aware of but which caused her no difficulty. This hypersensitivity was even present on the left side of her vagina and vulva on pelvic examination. In February 1951, immediately following a minor injury to her left knee, she developed severe pain in her left lower extremity, for which she was again hospitalized with the diagnosis of thrombophlebitis and treated with anticoagulants and bedrest with improvement. Moderate hyperesthesia of the left side was again noted at that time. She was given priscoline and left lumbar sympathetic blocks with only slight or no relief. Due to evidences of marked aggressive behavior, she was seen by the psychiatrist who felt that a large part of her symptomatology was on an hysterical basis. In April 1951 she was sufficiently improved to be allowed to return to duty in spite of her recurrent pain in the left leg. She continued on duty until March 1952, when she was again hospitalized at an Army Hospital in Wisconsin for a suspected pneumonia. Three days later, one of the ward personnel noted that she was keeping her left leg on top of the covers and she cried out as if in extreme pain when the nurse moved the leg. No physical abnormalities were noted in the leg, but due

to calf tenderness a diagnosis of thrombophlebitis was considered. The patient was extremely apprehensive and tense. She was given sodium amytal prior to examination by a consultant, and following this there was a spontaneous outpouring of a huge volume of personal complaints, family difficulties, interpersonal difficulties and personal hostilities. As a result of this she was studied by the Psychiatric Service. During the course to their observation she demonstrated marked evidence of emotional instability characterized by violent hostility, guilt and anxiety and aggression. She was found to be hyperirritable, aggressive and opprobrious, with tantrum-like behavior which at times required heavy sedation. Due to inadequate facilities at that Army Hospital she was transferred to this installation for further psychiatric treatment. Again it was noted that she was extremely hostile to the doctors, agitated, with numerous episodes of uncontrolled weeping and thrashing about. At this time the leg appeared to be swollen, edematous, with a violaceous mottled color to the skin, and marked superficial hyperesthesia. The dorsalis pedis and posterior tibial arteries could be felt although the plethysmograph showed evidence of reduced arterial pulsations. She again received priscoline, dosage 37 mgm 4 times daily with slight relief. A plaster cast was applied to the left lower leg in order to correct an early developing equinus contracture of the left foot with slight or no benefit.

It was felt by the Psychiatric Service that no benefit could be obtained from further psychiatric treatment or physical medicine measures and that the patient should be separated from the Army. This was discussed with the patient who reacted violently to such suggestion, implying that she did not wish to return to her home surroundings. Within a matter of 24-28 hours she had a miraculous and almost complete recovery from her symptoms. The swelling of the leg disappeared, skin color returned to normal and the patient voluntarily returned to duty.

Within a matter of months symptoms had returned to her left leg serious enough to impair her physical activities. The pain increased in severity to such an extent as to require readmission to the hospital on January 5, 1953. She again complained of marked pain in the left leg and also occasionally in the left arm, with discoloration and swelling of the foot similar to previous episodes. She again received priscoline and tolserol with no apparent relief. A walking cast was again applied in order to correct deformities with no noticeable change. Due to her failure to improve, and inability to perform duty she was separated from the Service in February 1953.

Family History and Past History. The patient's father was a fairly successful salesman, who was, however, dissolute, moderately alcoholic, a philanderer, violent tempered, and was frequently physically abusive to the rest of the family. Her mother was an intensely religious woman, but extremely nervous. An older brother was very successful socially and academically. A younger sister was deeply hated by the patient. The patient graduated from high school and at various times did college work in pre-nursing, pre-veterinary and journalism. Her occupational history included office work, auditing, physical labor and singing in a tavern. At the time of her hospitalization in March 1952, she was engaged to a man eight years her senior, who was of a different religion, whom she felt she did not love but whom she fully intended to marry.

Physical Examination. The abnormal findings were largely limited to the left lower extremity. She was noted to hold the left ankle in an extended and inverted position. The skin was dry and atrophic and revealed varying degrees of pallor and rubor which did not appear to be related to position. The dorsalis pedis and posterior tibial pulses were diminished on the left. She showed marked hyperesthesia to all sensory modalities in the left lower leg. There was mild weakness of the dorsi and plantar flexors of the left foot. Passive movements of the left leg elicited considerable discomfort and resulted in generalized muscle spasm of that limb.

A mild degree of hyperesthesia was noted in various areas of the left arm and about the left breast.

Laboratory Data. Hemoglobin, white count, urinalysis, serology, chest x-ray and x-rays of both feet and ankles were negative or within normal limits.

Discussion

Reflex sympathetic dystrophy is a well established and quite accurately defined clinical syndrome in which the etiology is difficult to describe and the physiology hard to explain. The basic mechanism is thought to be an abnormal reflex response of the sympathetic nervous system mediated through the internuncial pool[10,19] to minor trauma manifested primarily by vasomotor changes.[17] This condition has been described as resulting from primary causes such as skin abrasions, bruises, fractures, cold injuries, low grade infections, central nervous system disease, lacerations, arthritis, and burns.[3,5,7,10,12,13,20] A common finding is the apparent absence of etiologic disease.[11] Some observers have stated or implied that psychiatric factors were present in almost all cases.[2,6,9,20] Schumacher and Abramson, in their series of 142 cases, found 9 who had sufficient psychiatric disease to require formal psychiatric treatment.[20] Other observers have been of the opinion that the psychiatric difficulty is the result rather than the cause.[1,18] The seriousness of this disorder is reflected in the extent of the treatment used.[16] A large number of cases have been treated with sympathectomies with reports of from fair to good results.[4,6,8,14,15,18]

The experience of Schumacher and Abramson with this disease was unique in its magnitude and the patient control. Most common manifestations found were pain, swelling, cyanosis, coldness, hyperhidrosis, and numbness with occasional late changes of atrophy, stiffness and osteoporosis. A noteworthy observation was the rapid deterioration of the patient's attitude with delayed signs of improvement toward that of a chronic invalid. They concluded that in treatment the prime considerations were: (1) Prompt diagnosis and treatment. The degree of permanent disability was in direct proportion to the lapse of time before treatment was started; (2) Vigorous use of physiotherapy with stress being placed on active use of the involved limb; (3) Utilization of measures to disrupt the postulated reflex pathway with sympathetic blocks or sympathectomy if required; (4) Constant consideration of the patient's attitude and possible emotional factors; (5) Coordinated and concerted utilization of all therapeutic devices.[20]

These two cases are unusual in the magnitude of the psychiatric disorder and the paucity of the etiological organic disease. Both were immature, petulant, hostile young females with emotionally traumatic early lives who had found it impossible to adjust to the demands of formal school, military life, or marriage. Case II showed bizarre symptomatology involving the left leg, including three episodes of supposed deep thrombophlebitis, and chronic hemihyperesthesia over a three year period prior to the development of reflex sympathetic dystrophy. The framework of the psychiatric problem in both cases was broad and insoluble.

The response to therapy was poor. A careful analysis of their course and treatment could well explain this failure. The unusual clinical picture presented in each case resulted in considerable delay in arriving at the proper diagnosis. The prominence of the emotional features resulted in undue emphasis on these with poorly coordinated and insufficient use of physiotherapy. Absence of response to intensive psychotherapy suggests that undue persistence on this facet is about as futile as primary preoccupation with the relatively insignificant organic trauma which frequently causes this syndrome.

Reflex sympathetic dystrophy is an unusual, frequently severe and incapacitating condition resulting from relatively minor etiological factors varying from the strictly organic to the emotional. The possibility that

it might be mainly on a functional basis must not be allowed to confuse the issue to such a degree as to postpone prompt diagnosis and treatment. Regardless of the apparent etiology, the entire condition must be handled in accordance with established principles of therapy. Specifically, reflex sympathetic dystrophy of largely functional origin should not be treated entirely as psychiatric disease.

Summary

1) Two cases of reflex sympathetic dystrophy in young female patients with manifest psychiatric disease and no discernible organic etiology have been presented.

2) Postulated etiology and therapy for this condition was discussed.

3) Regardless of cause, treatment must be vigorous and in accordance with established principles of therapy.

Box MM
Cristobal, C. Z.

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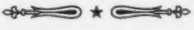

Credit Points Can Be Earned By Reserve Officers Attending the Convention.

Management of Chest Trauma*

By

LT. COLONEL ELMORE M. ARONSTAM, M.C.†

(Case report with two illustrations)

THE historical development of management of chest injury is, as in other aspects of developing medicine, an intriguing passage in medical knowledge. To be sure, we still are learning about chest injuries, but today we have a fairly good foundation of fundamental principles of treatment based on a sound physiological background largely free from prejudice and unproven opinion.

In war, exclusive of the late phases of the Korean conflict, chest injuries comprised from one-fourth to one-third of all injuries among the total killed in action. This has been true in almost all statistical analyses from 1850 to the present.[1]

Of the total wounded who survived to be admitted to medical units in wars up to World War I, 6 to 8 per cent suffered wounds of the chest. In World War I, the figure fell to about 3 per cent. However, in World War II, again 8 per cent of the chest injuries reached medical units for treatment, in American forces. It is interesting that although the percentage reaching medical units alive has remained relatively constant, the wounding agents have been different. Whereas bullets caused 87.4 per cent of injuries in the chest in the American Civil War, they caused approximately 30 per cent in World War II. Here high-explosive fragments caused the greater damage. Shell fragments caused only 12 per cent of chest injuries in the American Civil War, and they caused at least 65 per cent of injuries in World War II.

Striking has been the decrease in the mortality from chest wounds. For example, in the Peninsula War in 1814, the mortality was 33 per cent. In the Crimean War, 1854-56, the mortality was 26 per cent. In the American Civil War, 1861-65, the mortality was 27.8%. In World War I, 1917-18, the mortality was 24.06 per cent. In World War II, the mortality was 8.2 per cent. The precipitous drop came in World War II. At about this time, thoracic surgery was really coming of age. About this time, clear principles in the evacuation of wounded, and treatment of wounded, antibiotics, good anesthesia and whole blood were available for the first time.

In the Korean Conflict, great progress was continued in the handling of chest wounds. Of 1535 chest injuries studied at Tokyo Army Hospital,[2] a rear echelon unit, 66 per cent had penetrating chest wounds and 32 per cent perforating wounds of the chest; 2 per cent sustained crush injury of the chest. Of this group, 952 patients were treated for hemothorax or hemopneumothorax. Only 26 per cent of these became infected. One hundred fifty-two of these patients required later decortication, of whom 95 per cent returned to duty. The remainder were evacuated to the Zone of the Interior for further treatment. There were 104 cases of foreign body removal—all recovered—and all went to duty. One hundred and eight diaphragmatic hernia repairs were performed without mortality. These are amazing results considering there was a zero operative mortality for the whole group.

At a forward unit in Korea, a mobile Army Surgical Hospital reported[3] that of 163 thoracic and thoraco-abdominal injuries handled, there was only a mortality of 7.4 per cent. Of these 163 cases, only 12.9 per cent underwent thoracotomy, emphasizing the importance of non-operative management in emergency treatment of chest in-

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† Chief, Thoracic Surgical Service, Valley Forge Army Hospital, Phenixville, Pennsylvania.

juries. With the advent of armored vests in Korea, a marked decrease in casualties occurred, and this was reflected in the later flow of wounded coming from that region.

In the definitive management of thoracic injuries, the problem varies with the complexity of injury and organ involved.

Prime considerations in any wound are firstly, control of hemorrhage, treatment of blood loss; and secondly, local debridement and cleaning of wounds. In chest wounds, however, exclusive of the most superficial chest wall injuries, other complicated problems arise; problems in cardio-respiratory physiology, intra-pleural bleeding, esophageal leakage, cardiac wounding, diaphragmatic disruption, and concomitant abdominal injury.

Let us consider some of the types of chest injury at this point and offer remarks on each variety. A common injury in the military or civilian life is that injury which involves the fractures of many ribs on one side or both sides, giving rise to what is so-called the "flail chest." The physiologic problem in these patients is abnormal mobility of the chest wall. The chest wall moves inward on inspiration, preventing ingress of air through the trachea. The patient does not get oxygen in sufficient quantities because of the response of the mobile chest wall to a relatively negative inter-thoracic pressure. Similarly, because of this flail chest, the patient's secretions are not effectively raised.

Prime treatment under this set of circumstances is, firstly, the maintenance of a clear airway, repeated endotracheal suction or bronchoscopy, or even tracheotomy if necessary; and secondly, maintenance of some form of stability of the chest wall, either by external fixation, by bandaging, or a sandbag. Novocaine blocks for the relief of pain are of great assistance in this type of injury to help the patient make an effective cough. It is surprising how often a single blocking can effectively break up a pain cycle and give prolonged relief. It is important to emphasize that most instances of rib fracture do not cause a flail chest. Relief of pain and raising secretions are important problems.

A second type of injury, commonly seen in the penetrating wounds of the chest, is the sucking wound. The patient's difficulty in the sucking wound of the chest largely will depend upon the size of the opening. In general, when the opening in the chest wall exceeds the diameter of the patient's trachea or glottis, great difficulty is encountered in maintaining his oxygenation. With the inspiratory phase of respiration, air rushes in through the opening in the chest wall, collapsing the lung on the affected side and causing a displacement of the mediastinum towards the non-affected side. The emergency treatment in these cases consists of occluding the wound of the chest wall, observing and treating the patient for developing tension pneumothorax, by tubing, or aspiration; and, as soon as conditions permit, as soon as the patient appears out of danger, after his shock is treated, a closing of this chest wall defect with debridement of the wound edges. Timing is of the essence in this problem. In most of these cases, it is wise to drain the chest by means of underwater seal bottle and suction to remove air and serum that may accumulate.

A most common type of chest injury seen in civil practice is a chest wall injury associated with pneumothorax on one side and possibly mediastinal emphysema. These injuries are common to fractured rib or ribs. The patient is seen often in moderate respiratory distress, dyspneic, and subcutaneous emphysema may be palpated over the neck, chest, and lower trunk. Most effective treatment for this is immediate insertion of a chest tube and the connection of the same tube to an underwater seal bottle and suction. Relief of severe mediastinal and cervical emphysema can be accomplished with a collar neck incision. This may be a determining factor in obviating tracheal compression due to air in the tissues. This is, however, the most unusual necessity.

Hemothorax or hemopneumothorax is the most common variety of chest problem dealt with in overseas hospitals in a theater of

FIG. 1. Traumatic aortic aneurysm.

war. With hemopneumothorax, we have the problem of what to do with the air and blood in the chest and what to do if the patient continues to bleed. It is important to observe these patients ever so carefully for continued bleeding.

With continued hemorrhage, blood pushes the mobile mediastinum to the non-affected side. The patient has a marked decrease in aerating lung volume due to collapsed lung and the mediastinal shift. Impaired filling of the great vessels is also a problem. This is a highly critical situation. Continued bleeding most commonly comes from an intercostal or an internal mammary artery. Wounds of lung, particularly in the periphery of lungs, most often cease bleeding spontaneously. Wounds of the larger hilar vessels are frequently fatal before the patient reaches treatment.

Census of opinion in treating this type of injury in Korea was that the best plan of management was to repeatedly aspirate the chest and evaluate the patient carefully before transporting the wounded man farther to the rear units. To insert tubes and connect with underwater seal bottles was felt to be rather dangerous when transporting casualties. The bottle might, on occasion, be elevated above the patient's chest, producing reflux of fluid into the chest and contamination of the chest cavity; and, it was not uncommon to find that many of these patients evacuated from forward units with intercostal tubes developed empyema. Therefore, most hemopneumothoraces were treated by repeated aspirations in most forward units and, in the rear units, tube drainage was used to greater extent. Experience in Korea[2] shows that about 74 per cent of the patients treated were not infected. By and large, aspiration of a hemothorax appeared to be a very effective procedure. In from 60 to 70 per cent of the patients, it was possible to evacuate most all the blood and air by aspiration. The other cases developed clotting which had to be handled either by streptokinase or streptodornase installations with subsequent aspirations to remove the lysed material; patients in whom streptokinase was ineffective came to decortication. Decortication, of course, is optionally done at from three to six weeks post injury; at about this time, we can be sure that there is a fairly good pleural peel which can be removed with ease. Beyond six weeks, some fear that there will be some difficulty in establishing the good line of cleavage between the lung and the pleural peel. This is not always true.

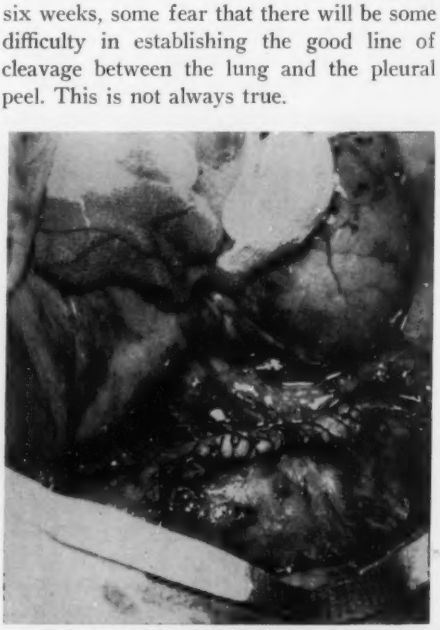

FIG. 2. Postoperative closure of aneurysm.

It has been surprising how infrequently it has been necessary to resort to emergent thoracotomy to repair lung lacerations. As far as the lung is concerned itself, most of these lacerations heal spontaneously, and there is generally very little need for emergency operation to repair a laceration. The presence of a foreign body, bits of tissue of clothing, development of abscess—all, of course, are later indications for a thoracotomy after the emergent problems are cared for.

The lung is injured, of course, in other ways beyond simple laceration due to perforating shell fragments, bullets, or rib fragments. Recently,[4] we have seen reports of hematoma of a lung due to direct blunt trauma to the chest wall, and the development of traumatic cavities in the lung; probably both arise by identical mechanisms. With the blunt trauma to the lung, and disruption of lung parenchyma by shearing forces, cavities are formed in the lung. When filled with blood, we regard them as hematomas; when only partly filled with blood, we regard them as cavities, traumatic cavities.

Good experimental background was found for the development of such lesions by Moolten in 1935,[5] who demonstrated that a parenchymal defect created artificially in any isolated lung would result on inflation of the lung in a cavity of approximately circular shape. This was due to lung retraction and lung elasticity. Observation of patients with these cavities and hematomas over a long period of time demonstrated that many are resorbed and no surgical intervention is necessary. Some, however, can become infected and require surgery.

A rare type of parenchymal lung injury is a rupture of the trachea or a rupture of a bronchus. Some may be extremely difficult to pick up early in the patient's treatment. The presence of frothy, blood-tinged sputum or a fairly copious hemoptysis is suggestive in a patient with respiratory difficulty. Commonly present is a persistent, recurrent pneumothorax or a severe tension pneumothorax, with mediastinal and subcutaneous emphysema. Bronchoscopy may be helpful in diagnosis. When, in the judgment of the attending physician, there is a rupture of a bronchus present, an early thoracotomy is necessary to restore the bronchus or resect the lung if repair is not feasible. Thoracotomy is the only way to avoid empyema, fibrothorax, functionless lobes or lungs due to secondary stenosis of bronchi. With competent help, and good timing, these can be handled successfully.

Intra-thoracic injury to major vessels is generally a fatal thing. It is most unusual to have a penetrating wound of any of the greater vessels of the lung or the heart without death. Exceptions, of course, occur, particularly in those instances of traumatic aneurysms or embolism of fragments which occasionally appear in the literature. However, these are exceptions to the general rule. Most persistent bleeding in the chest is due either to intercostals or the internal mammary artery, and surgical intervention must be taken to control it.

The treatment of the wounds of the heart is still somewhat controversial at the present time. There are those who feel that evidence of cardiac injury, laceration or tamponade requires immediate surgery. Perhaps, by and large, a great majority of surgeons treating this type of injury feel that for cardiac tamponade, recurrent aspiration of the pericardium to remove blood is the method of choice in handling these patients, reserving surgery only to those people in whom repeated aspirations are ineffectual in controlling the cardiac embarrassment. Aspirations are probably most effectively done by the sub-xiphoid route. Concomitant intravenous fluids are given to raise the venous pressure in these patients. Most people are fairly well agreed that fragments within the heart and within the chambers of the heart should be removed when the patient's condition permits safe exploration. Hypothermia and temporary caval occlusion[6] are of great value in removal of intra-cardiac foreign bodies. The problem of foreign

bodies in the lung is still unsolved. Most feel, I think, however, that a sizable foreign body within the lung parenchyma, the foreign body of over 1 cm. to 1.5 cm., should be excised. Similarly, foreign bodies in relation to vital structures should be removed by thoracotomy done at an elective time. This is not an emergent problem.

Diaphragmatic wounds are not at all uncommon in blunt injuries to the chest or penetrating wounds to the chest. Their prompt recognition is of vital importance and their early repair leads to a most successful outcome.

We have seen the highest mortality in both World War II and in the Korean conflict in the treatment of thoraco-abdominal injuries, injuries which give a higher mortality, the highest mortality of any chest injuries, largely because of involvement of abdominal structures such as colon and stomach and largely because of their great extent and greater shocking ability. At the close of World War II, opinion was largely in favor of a combined thoraco-abdominal exploration of these wounds. However, another point of view has recently been proposed by Rocky[3] from experiences in the forward areas in Korea. It was his feeling that the patient with a thoraco-abdominal injury should have a primary abdominal exploration to ascertain the extent of intra-abdominal damage, colon perforation, splenic wounds, and so on. It was his feeling that as the majority of chest wounds resulted in hemopneumothorax, these could best be handled by repeated aspirations of the chest, pre- and post-operatively. When it became apparent at laparotomy or earlier that there existed besides a diaphragmatic defect of sizable nature, major intra-thoracic bleeding, foreign body, or extensive lung damage, the abdominal incision could be extended up anteriorly and laterally and the chest opened at the same time. His experience with thoraco-abdominal wounds led him to the point of view that the safer approach was an early abdominal exploration first, treating the chest wound by repeated aspirations and only extending the abdominal incision into the chest where definite indication was present.

Injuries to the thoracic duct are extremely uncommon in both civil and military practice. It seems most definite at this time that ligation of the thoracic duct proximally and distally to the injury is the treatment of choice when it has been injured. Repair is most difficult or impossible, and ligation is the only way to prevent a chylothorax.

Esophageal wounds must, of necessity, be diagnosed early, and this is often quite difficult. Prompt repair or resection should be done as soon as the diagnosis is entertained. Delay in recognition leads to contamination of pleural cavity and sepsis. When these injuries are picked up late, if the patient has survived drainage of the chest and gastrostomy are indicated. Later, planned reconstruction must be undertaken.

In conclusion, I would like to present one brief case history and pre- and post-repair photographs of a most unusual thoracic injury—a traumatic aortic aneurysm secondary to blunt trauma of the chest.

This nineteen-year old soldier was injured in January 1954 in an automobile accident while a passenger. He sustained a compound fracture of the lower third, right femur, a fracture of the mandible, and severe contusions of the left chest. Initial X-rays of the chest demonstrated a lone rounded shadow occupying the upper posterior half of the left chest. The patient had no respiratory difficulty. Peripheral pulses and pressures were normal. No murmur was heard over this lesion. Fractures of the femur and mandible were treated appropriately and proceeded to healing and function. The chest lesion was only observed, and clearing of the shadow occurred. With clearing, a knob-like lesion was disclosed in the distal aortic arch. This patient was suspected to have an aneurysm of traumatic origin. This was confirmed at surgery, at which time it was excised and an aortic repair performed. Post-operative course was extremely benign. The patient is now four

months post-operative and doing well at present. This represents a most unusual lesion while prognosis cannot be predicted we expect it to be excellent.

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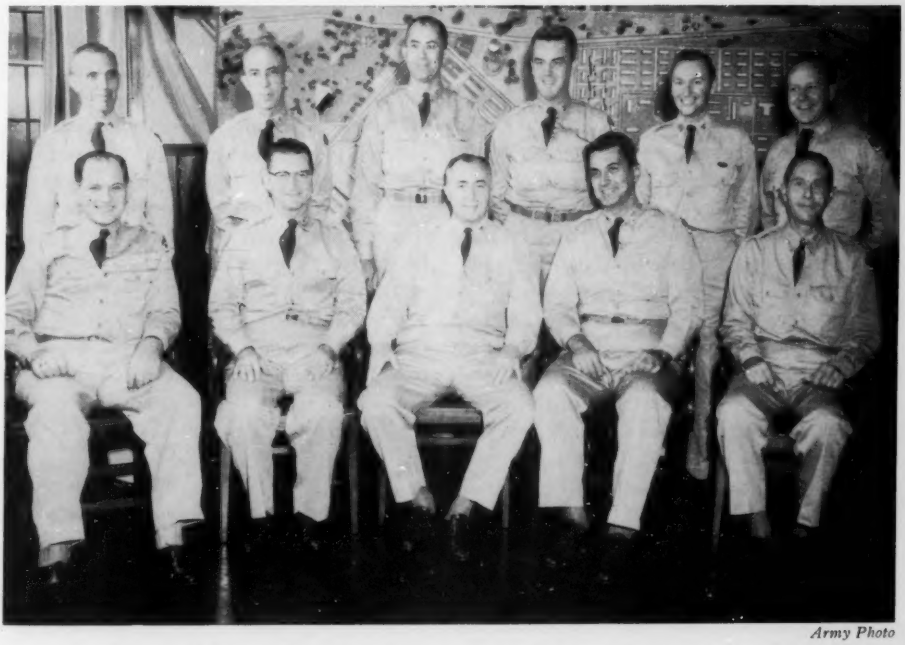
STAFF OFFICERS—805TH HOSPITAL CENTER, WASHINGTON, D.C.
TAKEN DURING SUMMER CAMP TRAINING, FORT BELVOIR, VA.



Army Photo

Seated, left to right—Lt. Col. A. Prager; Lt. Col. G. M. Beam (Advisor, DC Mil. Dist.); Brig. Gen. Frank E. Wilson, Commanding General; Col. L. W. Gray; Col. S. A. Leishear.

Standing—Capt. H. H. Baker; Maj. L. C. Morley; Maj. K. Earnhardt; Capt. A. R. Groom; Capt. R. L. Rothrock; CWO Warren Showalter.

The Safety of Blood Transfusion in the Treatment of Mass Casualties*

By

LT. COLONEL WILLIAM H. CROSBY, MC, USA†

(With four illustrations)

LESSONS learned in combat are of value in planning for the care of mass casualties occurring under whatever circumstances, as results of tornadoes, fires, accidental explosions or enemy bombardment. When the use of large amounts of transfused blood became an important part of the treatment of the severely wounded, it was imperative that the blood be safe. It had to be safe not only for the recipient of one unit, but also for the man who might require ten units or twenty or thirty within a period of a few hours. Every transfusion involves certain dangers. Only the vigilance of those who operate the transfusion service keeps the danger to a minimum. This is difficult enough when a single hospital encompasses the transfusion service, but difficulties multiply when the service extends throughout a theater of war or any widespread disaster area. The agency that supplies the combat zone has a responsibility to provide blood that is: (1) Adequate in quantity and delivered frequently, (2) As fresh as possible, (3) As well preserved as possible, and (4) As safe as possible. We shall consider only the last part of this problem, the safety of the blood as it is provided and also as it is used.

In Korea, for the first time, the transfusion service in support of a fighting army was able to provide ample amounts of fresh whole blood wherever it was needed—in mobile surgical hospitals supporting the combat divisions and even at battalion aid stations during periods of heavy action. Medical officers learned that large, rapid transfusions given early could save the lives of many of the most desperately wounded. But some observers, looking beyond these excellent results, expressed disquieting fears that the transfusion of such amounts of blood—especially stored blood—might of itself be injurious. The U. S. Army's Surgical Research Team installed at one of the forward hospitals undertook, among other problems, a study of the effects of blood transfusion in battle casualties. They examined the problems of "over transfusion," pigment metabolism, hemostasis, potassium and citrate intoxications and the relation of transfusion to acute renal insufficiency. Results of these studies are most reassuring. The quality of blood delivered to Korea was good, and transfusion as a therapeutic instrument was not abused. In fact it was found that the requirements for transfusion of the severely wounded were rather consistently, though not seriously, underestimated. ***The fears regarding injury from transfusion proved, on the whole, to be groundless.***

UNIVERSAL DONOR BLOOD

During the Korean war incompatible transfusion reactions were almost completely obviated by the decision to use only Group O, universal donor blood. Thus, one type of blood was given to all recipients irrespective of their individual blood groups. The plan has much to commend it.

1. Transfusions may be started without waiting for cross matching.

2. Skilled personnel for cross matching are not needed.

3. An adequate blood bank can be maintained with fewer units of blood than are

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† Department of Hematology, Army Medical Service Graduate School, Walter Reed Army Medical Center, Washington 12, D.C.

required when all types of blood must be provided.

4. Small stocks of blood may be established and used in remote aid stations.

5. The army in the field is relieved of the responsibility of assuring the compatibility between donor and recipient.

The value of Universal Donor Blood resides in the fact that its red cells possess no antigens that can be attacked by the spontaneously occurring antibodies of the ABO blood group system. There is no incompatibility directed at the donor red cells (Figures 1A and B). The donor plasma, however, contains anti-A and anti-B antibodies. These are incompatible with the red cells of A or B recipients but usually do no damage because they are rapidly dispersed, diluted and neutralized during the course of the transfusion. Even so, the indiscriminate use of Universal Donor Blood is unsafe because a few donors possess antibodies of high titer or great virulence, and transfusion of their *plasma* may provoke a severe hemolytic reaction in a recipient of group A, B, or AB (Figure 1C). (The group O recipient is safe because there is no incompatibility.) It is necessary to eliminate the "dangerous universal donors" from the panel of a transfusion service that depends on Universal Donor Blood.

The meticulous laboratory control of the combat-zone transfusion service that supported the Korean war was carried out at Travis Air Force Base, California, and at the 406th Medical General Laboratory in Tokyo where the blood collected in the U. S. and Japan was processed. It cannot be overemphasized that under this system the prevention of incompatible transfusion reactions in the combat zone rests entirely upon the laboratory control at the blood donor centers. To prevent such reactions two tests are essential: (1) verification of blood group

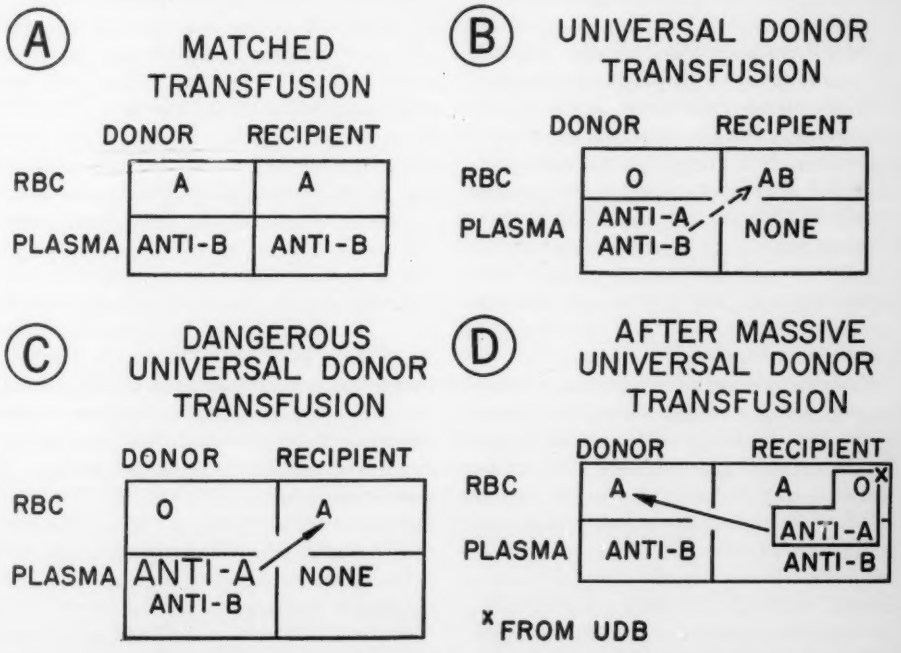


FIG. 1. Solid arrow indicates an incompatibility between plasma and red cells (RBC) that can cause severe transfusion reactions. Dotted arrow indicates an incompatibility of no clinical significance. UDB stands for Universal Donor Blood.

to be certain that no weakly-reacting bloods of groups A or B had mistakenly been labelled group O, and (2) establishment of the titer of anti-A and anti-B antibodies in the plasma of each unit of blood to eliminate dangerous universal donors.

The first was done by scrupulous testing with highly potent typing sera. The second was accomplished by a screening test of the agglutinating antibodies. Serum was diluted with saline 1:200 or 1:250, and a mixture of A and B red cells was suspended in it. If agglutination occurred, the blood was labelled HIGH TITER. Where no agglutination occurred, the blood was considered to be low titer and safe Universal Donor Blood.

About 15 per cent of the blood sent to Korea was high titer. It was plainly marked as such with an additional admonition "To be used only in group O recipients." Much of this blood was not used and became outdated. The medical officers suspected that it was dangerous—or somehow off-color—and refused to accept it even for group O recipients. Although their reasons for this were more intuitive than rational, they were right to refuse. The blood group that is stamped on a soldier's dogtag is incorrect in 8 per cent. If a group A man, improperly identified as group O, were transfused with HIGH TITER blood he might possibly have a severe transfusion reaction due to the incompatibility of the plasma (Figure 1C). Before the war came to a close it had been recommended that only low titer group O blood be provided for the combat zone.

Parenthetical to this discussion, it should be pointed out that there is needed a better test to identify dangerous universal donors. By the present standards only 55 to 65 per cent of group O donors can be classified as low titer. The others are not all "dangerous" yet the test is intended to eliminate only those who are. It errs on the side of caution. Several types of antibodies are involved in incompatible transfusion reactions: agglutinins, hemolysins, incomplete antibodies and perhaps others. Blood is classified as high titer or low on the basis of an agglutination test because, of the several sorts of antibodies, the agglutinin is easiest to demonstrate. However, the agglutinin itself is not the dangerous antibody. Hemolysins and incomplete antibodies are believed to be the ones that cause reactions. The agglutinin test eliminates dangerous donors because a high titer of hemolysin is usually associated with a high titer of agglutinin. The lack of selectivity of this procedure wastefully restricts the panel of universal donors. For this reason, it is important to characterize more completely the dangerous universal donor and then to devise a precise test to identify him.

The Surgical Research Team found that even low titer Universal Donor Blood, when used in large amounts, is not without some effect upon the red cells of the recipient. Group A patients who received 15 or 20 pints of group O blood would be found immediately after the transfusion to have about 70 per cent of their native red cells replaced by donor cells. (This was demonstrated by using anti-A typing serum to agglutinate the group A cells. The group O donor cells remain unagglutinated and can be counted in the usual manner.) Subsequently the proportion of donor cells would increase without any further transfusion. This meant that the native group A red cells were being eliminated. Sometimes all of them disappeared, so that a patient of group A would be found to have practically 100 per cent of group O cells in his blood. The selective loss of his own cells after bleeding and transfusion had ceased, was undoubtedly due to the activity of the anti-A antibodies in the plasma of the donor blood. It is emphasized that the hemolysis was a gradual process. It was not associated with an abrupt, shocking reaction of the sort encountered after incompatible transfusions. Clinically one could not tell that a hemolytic process was at work, and the patients suffered no obvious harm.

In some men who received large transfusions of Universal Donor Blood it was possible to demonstrate the persistence in

their plasma of incompatible antibodies that had been transfused into them. For example, a patient of group A might be found to have anti-A agglutinins in his blood. Although this situation—as pointed out above—was of little clinical detriment, it was recognized to be a source of potential danger to the patient. Medical officers at forward hospitals in Korea sometimes deemed it desirable to provide fresh blood for men who had received large amounts of bank blood, and in ordering such transfusions they often asked that group-specific blood be obtained. The laboratory technician was then confronted with the problem of determining the blood group of a patient whose blood contained 2 sorts of red cells—the group O universal donor cells and those of his hereditary group. Sometimes there were so few of his own that the typing serum would produce only scattered pinpoints of agglutination, a difficult result to interpret. The cross match was equally difficult when the presence of "foreign" antibodies in the patient's serum would cause agglutination of blood cells of the patient's own group. This indicated that the patient could no longer be safely transfused with blood of his hereditary group. The passively acquired antibodies were incompatible with his own blood group. Suppose now the technician after testing 20 donors decides that several of the cross matchings looked less incompatible than the others and releases those units of blood for transfusion. An incompatible transfusion reaction might result (Figure 1D).

The same accident may happen in a more subtle way. For example, a severely wounded man was admitted to a surgical hospital. It was apparent that he would require many units of blood during the period of resuscitation and surgery. It was decided to use, in part, fresh, group-specific blood, and blood for cross matching was taken from the patient. Donors were called from nearby troop units. Six of them were cross matched against the patient and were bled. This required several hours to complete. Meanwhile the patient had received 18 pints of Universal Donor Blood. When transfusion with the fresh blood was begun the patient went into shock and his plasma was found to be stained dark red with hemoglobin, the obvious signs of an incompatible transfusion reaction. Unfortunately, the patient's red plasma was not examined for the antibodies that might have caused the reaction.

Because of this danger, the Department of the Army has issued a transfusion precaution: *"The use of group specific blood may be dangerous following large transfusions of Group O, Universal Donor Blood, causing severe hemolytic reactions. In any instance where multiple transfusions have been made with Group O blood, subsequent transfusions given within a period of 2 weeks following the initial transfusion will be with Group O blood."*

Rh-positive blood was the only type used in Korea. As a consequence of this, about half of the Rh-negative patients who received transfusions developed anti-Rh (anti-D) antibodies. The use of Rh-positive blood in Rh-negative recipients involves no threat of an incompatible transfusion reaction unless the recipient has been immunized against the Rh antigen prior to the transfusion. Such immunization requires preliminary transfusion or pregnancy, both of which are unlikely in a population composed almost entirely of healthy young males. Where civilian populations are involved the problem is more difficult. While it is not desirable to immunize women with childbearing potential, still one is left no choice when he must decide between immunization and the saving of life. The care of mass casualties inevitably requires some compromises, and decisions are often dictated by expediency. A woman should not be permitted to die while her blood is being typed and cross matched.

Blood Donor Service in Combat Zone

The establishment of a blood donor service in the Korean combat zone was suggested from time to time during the war. This was

not undertaken for several reasons:

1. An army in the field should not be required, except under extreme conditions, to provide its own supplies.

2. In the field it is difficult to maintain the standards of sterility, technical excellence and detachment that are the minimal requirements of such a service.

3. The transfusion service would be vulnerable to enemy action. A blood depot can be re-established in a few hours by bringing up more blood but a blood donor service, with its essential laboratory and skilled technicians, cannot be quickly or easily replaced.

It was mentioned above that small quantities of blood had been obtained locally in Korea from our own troops for use in the Army surgical hospitals. It is believed that most of the incompatible transfusion reactions that occurred were a result of the use of this sort of blood. In 1952 only 4 patients were admitted to the Renal Treatment Center in Wonju with a history or evidence of post transfusion hemoglobinuria and renal insufficiency. In all 4 patients the reaction had been associated with the administration of blood procured locally. The laboratory of a mobile hospital is not intended and is not equipped to operate a blood procurement service and the technicians are not trained well enough to be relied upon. The danger outweighs any value that fresh blood may have over stored blood. Excepting emergencies, the local procurement of blood in the combat zone is not recommended.

Cadaver Blood

The use of cadaver blood, as practiced in Russia, was considered but not investigated. This source of blood is unattractive for more reasons than an aesthetic one.

1. The killed in action are usually widely dispersed, and priority of recovery must be given to the living wounded.

2. Most of those killed in action die as a result of cutting major blood vessels, hence much of the blood could not be recovered.

3. Bacterial contamination of blood remaining in the body after death from gunshot wounds would be a hazard.

4. The objections, outlined above, to the local procurement of blood in the combat zone apply with equal force here.

Transfusion Reactions

Recognition of transfusion reactions is a problem that troubles every good transfusion service. The clinicians who administer the blood are not always discriminating—sometimes they fail to report reactions and sometimes they assume that any coincidental fever or chill is due to the transfusion. Without a careful examination of each case suspected of a reaction, even an expert can be wrong. One visitor to the hospitals in Korea reported that the rate of transfusion reactions was probably high because patients receiving transfusions were observed to shiver and some passed dark urine. The Surgical Research Team formed a different opinion. They examined the blood of such patients and found no evidence of transfusion reactions. It should be noted that shivering may be due to cold and that severely wounded patients were rapidly transfused with ice-cold blood. Shivering can also be due to bacteremia, a condition that is not unexpected in casualties with extensive, heavily contaminated wounds. Dark urine is also to be expected in patients with severe muscle wounds. The pigment that appears in the urine of these patients is myoglobin, not hemoglobin.

On the basis of the observations of the Surgical Research Team it was concluded that the incidence of incompatible transfusion reactions in Korea was exceptionally low. The statistics of the Renal Treatment Center support this. Over 50,000 transfusions were given in Korea in 1952. In that year, as mentioned above, only 4 patients were admitted to the Center with acute renal insufficiency due to an incompatible transfusion. There probably were more than 4 reactions: some died and some recovered without going to Wonju. Inquiries found few of them.

Although the rate of incompatible transfusion reactions was low, there are no accurate figures on the subject. This should not be allowed to happen again. It is important to have a continual examination of the problem. The careful study of each reaction provides information that is needed to prevent subsequent reactions. Even the meager information provided by the statistics of the Renal Treatment Center suggested that most, if not all reactions in Korea, were a result of using locally procured blood. To the end of obtaining this essential information two recommendations are made:

1. The personnel who administer transfusions should be well trained to recognize reactions and should know what records to make and what specimens to collect so that the cause of the reaction can be identified.

2. There should be quickly available in the combat zone an expert who can interpret the evidence and identify the cause of the reaction.

Bacterial Contamination Reactions

Transfusion reactions due to bacterial contamination of stored blood are rare but when they occur they are usually fatal. In most transfusion services in the U. S. there is no provision for culturing blood that is assumed to be sterile. In a few centers where carefully controlled studies of the problem have been made it has been found that about 3 per cent of the units of blood collected under vacuum into glass equipment were contaminated. When blood was collected into plastic equipment, with the donor tube fused to the bag (Figure 2), the rate of contamination was 0.6 per cent. These studies were based upon cultures incubated at warm temperatures and most warm-growing organisms do not grow in the cold. On the other hand, certain cold-growing bacilli do not proliferate in warm cultures although they multiply freely at refrigerator temperatures. Bacterial contamination does not appear to be an important problem in the U. S. In most transfusion services, blood is turned over rapidly, much of it remaining in storage less than 5 days. This reduces the opportunity for bacteria to increase to dangerous numbers. Blood used in the combat zone has been stored longer, and the danger is therefore somewhat greater. With the development of methods to extend further the storage period of bank blood the problem of bacterial contamination may become even more serious. Although, in the Korean experience there were no known instances of "transfusion catastrophe" due to bacterially contaminated blood, they may have occurred without being recognized. Under the circumstances, the basis of such reactions would have been difficult if not impossible to prove. Nevertheless, the problem confronts us, and it is one of the most compelling reasons for adoption of plastic blood collecting equipment. The plastic bag should have the donor set fused to it as an integral part to reduce contamination during collection of the blood. This type of blood bag permits still another safeguard against the transfusion of contaminated blood. After phlebotomy, the plastic donor tube, sealed at its distal end, remains attached to the blood bag. Before the unit is used the blood in the tube is milked into the bag and the tube is permitted to refill. Another seal is made in the tube, closer to the bag. The tube is then cut between the two seals and a smear of the blood is stained and examined for bacteria (Figure 2).

Plastic transfusion equipment obviates another source of danger. Rapid transfusion was often necessary to save the lives of severely exsanguinated men. It was the custom in Korea to pump air into the transfusion bottle. The danger, of course, was that of air embolism and to prevent this a technician was detailed to the job of watching the pressure transfusion. When plastic equipment is used pressure is applied not by inflation but by squeezing the collapsible bag.

The adoption of plastic equipment has already been recommended by the three Armed Services and it should become standard within a year. If among its other attributes of less weight, less volume, and less breakage, the use of plastic can permit blood to be

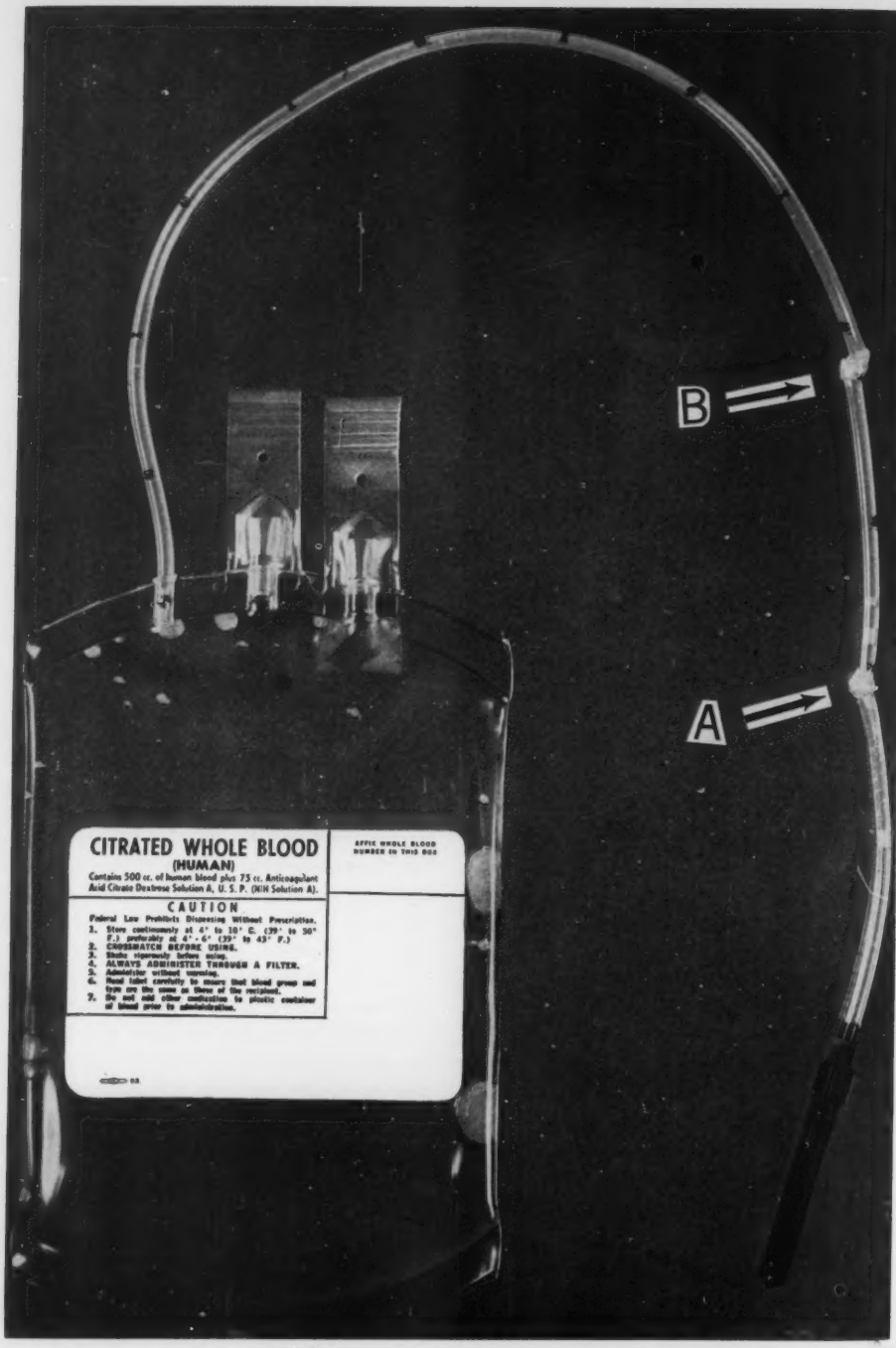

B
A
CITRATED WHOLE BLOOD
(HUMAN)
Contains 500 cc. of human blood plus 75 cc. Anticoagulant Acid Citrate Dextrose Solution A, U. S. P. (NIH Solution A).
CAUTION
Federal Law Prohibits Dispensing Without Prescription.
1. Store continuously at 4° to 10° C. (39° to 50° F.) preferably at 4° - 6° (39° to 43° F.)
2. CROSSMATCH BEFORE USING.
3. Shake vigorously before using.
4. ALWAYS ADMINISTER THROUGH A FILTER.
5. Administer without warming.
6. Read label carefully to insure that blood group and type are the same as those of the recipient.
7. Do not add other medication to plastic container of blood prior to administration.

FIG. 2. PLASTIC BLOOD COLLECTION CONTAINER WITH INTEGRAL DONOR SET (FENWAL).

After the bag is filled with blood one knot is set in the tube (A) and the blood between the knot and the bag is stripped into the bag. Blood distal to the knot can be used for typing. When it is desired to test for bacterial contamination the blood that refluxed to the tube is again stripped into the bag. After the tube has refilled itself, a second knot is set at B. With aseptic care the tube is cut between A and B. The blood obtained can be cultured or otherwise examined for contamination.

dropped from aircraft, our transfusion service will become even more flexible.

The use of old blood was once suspected to be a serious fault of the transfusion service in Korea. The blood received at the forward hospitals was 8 to 10 days old and most of it was 10 to 15 days old before it was used. Fears were expressed that the blood might have been injured by its long journey across the Pacific during which the refrigeration could have been interrupted. The blood arriving at the forward hospitals was suspected of containing a high proportion of nonviable red cells, cells that could live in the circulation less than 24 hours. It was suggested that the destruction of these red cells in patients who received large transfusions would produce hemoglobinemia intense enough to damage their kidneys. The work of the Surgical Research Team demonstrated that the blood arriving at the forward hospitals was well preserved (Figure 3), that refrigeration had been well maintained and that the proportion of nonviable red cells was probably not much greater than it is in blood stored for similar periods in the U. S. The destruction of these nonviable red cells by the recipient was not associated with significant levels of hemoglobinemia (Figure 4). The cells were lost from the circulation within 24 hours, but the evidence indicates that most of them did not release their hemoglobin into the plasma and their destruction

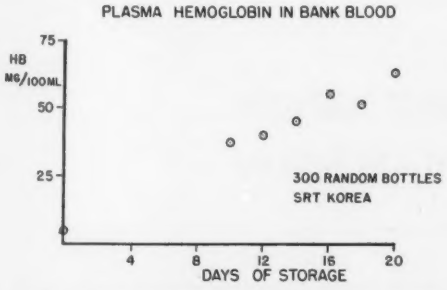


FIG. 3. The concentration of hemoglobin in the plasma of bank blood is a good index of the care it has received. The values indicated above are agreeably low. Even at 20 days a plasma hemoglobin concentration of 70 mg. per 100 ml. represents the loss of only 0.5 per cent of the total red cells in the bottle.

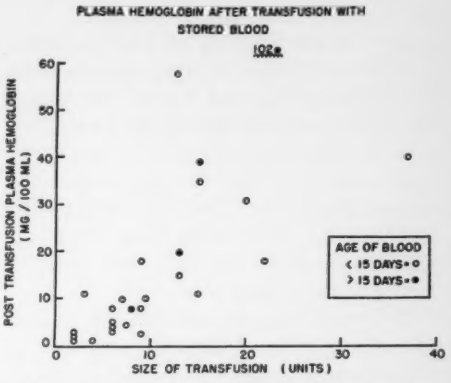


FIG. 4. Patients' plasma hemoglobin after rapid transfusions with stored blood. Even large transfusions of relatively old blood did not cause hemoglobinemia of a degree apt to be detrimental.

did not throw an excretory burden upon the kidneys of the patient.

Far from being injurious, it seems that "outdated" blood could be of value as a plasma substitute. Hemoglobin comprises 80 per cent of the protein of whole blood but it cannot be given as a concentrated solution because of its dangerous vasorenal effects. Given as old blood very little of the hemoglobin is released to the plasma. A patient might receive such blood as an antidote for shock, and even though a high proportion of the cells did not survive for many hours their protein, when they are destroyed, would become available to the patient. There seems good reason to suggest that outdated blood may be useful for treatment of the moderately wounded who require less than 5 units of blood. The use of old blood as a nutritional adjuvant was practiced by the Koreans without detriment to their patients. Blood that had been refrigerated as long as 60 days was useful. As a matter of economy the value of such blood deserves investigation in the treatment of wounded who are not critically injured. We must be ready for a time when blood may not be provided in the quantities available in Korea.

SUMMARY

1. The decision to use universal donor blood in the combat zone in Korea obviated

incompatible transfusion reactions. This practice in the handling of mass casualties permits transfusion to begin without delay for cross matching, and it places the responsibility for compatibility of the transfusion upon the supplying agency in the rear rather than upon those who use the blood under adverse conditions. The few incompatible reactions that occurred in Korea were usually due to blood that had been procured locally in the combat zone.

2. It was found that massive transfusions of universal donor blood in recipients of other groups sometimes resulted in an accumulation of transfused antibodies that were active against red cells of the recipient. This made it unsafe to transfuse the patient with blood of his own hereditary group when subsequent transfusions were required. The foreign antibodies required as long as two weeks to disappear.

3. The problem of bacterial contamination of stored blood did not appear to be the cause of reactions, but the matter deserves study as to how best to prevent or control it. The use of plastic bags is expected to improve this situation.

4. The use of old blood even in large amounts rapidly given caused little if any damage that could be attributed to the age of the blood. Declaring stored blood to be outdated after 21 days seems a reasonable precaution, but it is suggested that well refrigerated blood up to 60 days of age might be employed as a "plasma substitute" in the less severely wounded.

Factors Influencing the Staffing of Military Hospitals

By

LIEUTENANT COLONEL MILTON C. DEVOLITES, MSC*

(With three charts)

SECTION I—GENERAL

SINCE personnel accounts for more than 75 percent of hospital operating costs, it is important to consider the principal factors affecting staffing and ascertain to what degree they are controllable.

The best known ratio expressing personnel requirements is the number of full-time personnel per 100 patients occupying beds. Another measure which takes patient turnover into account is the number of employees per 100 admissions; perhaps the most accurate ratio is the number of employee hours of work per inpatient day.

Figure 1 illustrates that there is a continuing increase in the number of personnel per 100 patients occupying beds in all U. S. hospitals. Even in Federal hospitals there was an increase of 21.7 percent from 1946 to 1953.

The most significant factor affecting the *total number of personnel* is the *patient load* expressed by the number of occupied beds. The increase in personnel required to staff a given hospital is directly proportional to the total number of patients. While this appears obvious, the number per hundred patients will vary between two hospitals of equal size because many different factors exert either an upward or downward influence. For this reason, the staffing ratio is now an unreliable measure of comparison for either personnel needs or utilization. For example, staffing experience shows that among Class I hospitals one with 1000 patients appears to be the most economical to operate. However, this does not hold with a Class II hospital with 1000 patients because a Class II hospital has a more comprehensive program of medical services as well as greater specialization of functions.

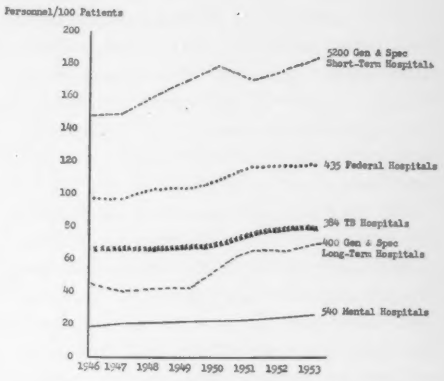


FIG. 1
Average Full-Time Personnel Per 100 Patients Occupying Beds
Source: *Hospitals,* Part 2, June 1954, Statistical Guides, p. 24. (Journal of American Hospital Association)

Among the factors causing an increase of personnel needs are the following: patient turn-over, medical specialty, acuity of illness, special services, training, research, hospital dispersion, shorter work week, high standards of service, and poor management.

Factors which tend to decrease staffing requirements include stabilization of workload, consolidation of activities, effective command policies, adequate professional staff, and effective administration.

SECTION II—FACTORS WHICH TEND TO INCREASE STAFFING REQUIREMENTS

1. *Patient turn-over* may be expressed as the number of admissions or dispositions per day per 100 patients occupying beds. The greater the patient turn-over, the greater is the demand on hospital services. Associated with this factor is the length of patient stay. It follows that the shorter the stay the more rapid the disposition. When this is complemented by a large number of admissions, the

* Office of The Surgeon General, Department of Army, Washington 25, D.C.

patient turn-over is high. Army hospitals in the past few years have shown a gradual reduction in the number of occupied beds. Yet certain hospitals have continued to have the same number of admissions and speeded up their dispositions by an appreciable reduction in length of patient stay. This has been more noticeable since 1952. While a large number of occupied beds places greater demand on general services in the hospital, a high patient turn-over coupled with a lower occupancy decreases the load on general services but increases the work of the professional staff and the Registrar Division. In this situation, fewer personnel are required in food service, custodial, supply and laundry. On the other hand, patients with shorter stay require more intensive medical and nursing care, more laboratory and X-ray procedures per patient day, the more pharmaceuticals and specialized treatments. The faster the turn-over, the greater is also the workload of the Registrar Division in processing admissions, dispositions, and reviewing clinical records. Figure 2 illustrates the situation in a Class II hospital where there was a reduction in the number of occupied beds but with little change in number of admissions. Figure 3 shows the trend in length of patient stay at the same hospital.

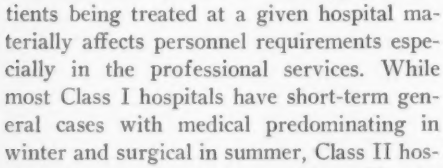


FIG. 2
Average Beds Occupied by Month
Class II Army Hospital

2. *Medical Specialties.* The type of patients being treated at a given hospital materially affects personnel requirements especially in the professional services. While most Class I hospitals have short-term general cases with medical predominating in winter and surgical in summer, Class II hospitals have a more stable workload. Yet the

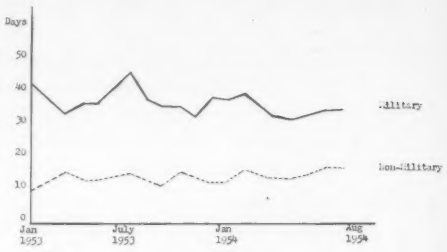


FIG. 3
Average Length of Patient Stay—
Total Number of Days in Hospital
Total Number of Discharges

nature of specialized treatment being offered varies with each hospital. For example, Walter Reed, Brooke, and Letterman are similar in having predominantly surgical and medical patients in about equal proportions. Fitzsimons and Valley Forge are more alike in having large numbers of TB and NP patients. On the other hand, Beaumont and Madigan are characterized more by short-term station type cases. Accordingly, the staffing situation in each Class II or Class III hospital is different and it is only on a function by function basis that any valid comparison can be made. Experience indicates that the nursing care requirements are greater for surgical cases than for medical or TB. OB-Gyn and pediatric patients, constituting approximately 40 percent of hospital admissions and 25 percent of occupied beds, absorb more than 50 percent of the professional nursing staff. While TB and NP patients generally have a length of hospital stay of several months, OB and pediatric cases are usually out of the hospital within a week. The types of specialties operated at a given hospital determine the composition of the medical and nursing staffs.

3. *Acuity and Complexity of Illness.* This is an important factor in determining personnel requirements of professional services. From studies on categorization of patients according to nursing care needs, the following classifications have been developed:

Category I—Those patients who require intensive nursing care.

Category II—Those patients who require moderate nursing care.

Category III—Those patients who require minimal nursing care.

Category IV—Those patients who require supportive care on a clinical basis.

The percent of patients in each category varies with each hospital and more between Class I and Class III hospitals. In one Class I hospital of 500 beds where the clinic quarters concept is effectively implemented, the distribution of patients in a six-month period was as follows:

Category	I	II	III	IV
Percent	7	31	32	30

In a large Class III a sample survey of one week indicated 20 percent—Category I; 30 percent—Category II; 30 percent—Category III; and 20 percent—Category IV.

It appears that if manpower survey teams are to be equitable in making staffing determinations they must give attention not only to the preceding two factors but also to the categorization of patients. The greater the number of difficult cases, the larger the number of patients in Category I, the more nursing personnel are needed, and the greater the laboratory and X-ray tests required. While a scattering of Category I and II patients in many different wards exerts an upward pressure on personnel requirements, concentration of such patients in recovery or intensive treatment wards makes possible a conservation of nursing personnel coincident with better care for patients. When the clinic quarters concept is practiced, patients who can be treated on an outpatient or clinic basis are moved out of active wards and into barracks or convalescent wards. In this manner, they can be supervised primarily by nonprofessional personnel.

The impact on staffing brought about by changes in the nature of the patient load is best shown when the treatment-time of military out-patients is compared to that of military dependents and retired personnel. Whereas on the average a medical officer spends six minutes per soldier, he spends 20 minutes per dependent. When the proportion of dependents to military outpatients increases, the staffing requirements also increase. It is because of shortage of medical officers to meet the increase in the dependent load that waiting time in outpatient clinics is progressively getting longer.

4. *Special Services.* With each advance in medical service there have developed such specialized services as laboratory, X-ray, medical records department, blood bank, electrocardiography, physiotherapy, pharmacy, outpatient services, cancer clinic, occupational therapy, electroencephalography, and radioisotope laboratory. The comprehensiveness of a hospital service program in terms of the number of the basic professional services and the number of special services is an important determinant of staffing. The Commission studying the factors affecting costs of hospital care in the U. S. found that "as a measure of the scope of hospital service the number of special services offered is a better index than bed capacity."[1] It was surprising to the commission to find that radioactive isotopes which only a few years ago were top secret, in 1952 were being used in more than 6 percent of all general hospitals. On the other hand, 7 percent of all hospitals reporting in 1952 still did not have diagnostic X-ray service. "Still more surprising is the fact that 23 percent of all general hospitals did not have a medical records department."[2] One reason why the staffing ratio for small Army and Air Force hospitals is greater than for larger hospitals is the fact that a certain number of personnel are required for the readiness to serve. Another is that several special services are provided which generally are only found in larger civilian hospitals. Military small hospitals need the special services because they often serve military garrisons in remote and isolated stations whence it would be difficult and uneconomical to transfer patients to large medical centers and where civilian hospitals cannot provide adequate medical service. Military specialized

[1] Commission on Financing of Hospital Care—*Factors Affecting the Costs of Hospital Care,* Edited by John H. Hayes, The Blakiston Div. McGraw-Hill Book Co., Inc., New York, 1954, page 28.

[2] *Ibid.* Page 30.

treatment centers, moreover, not only have extensive departmentalization of medical services but also advanced specialization in the supportive diagnostic and therapeutic services. A combination of these two factors creates the need for additional technical personnel and thereby increases the staffing requirements.

While specialization leads to very high standards of medical care on one hand, on the other hand it calls for more highly skilled personnel.

5. *Training.* Training of interns and residents in medicine, dentistry and other professional fields is generally accomplished in the large hospitals or selected specialized treatment centers. While such professional trainees do provide service to patients, the conduct of a training program for them requires additional clerical personnel, increased diagnostic work in laboratory and X-ray, and the writeup of more detailed and accurate clinical records and reports. Training facilities, professional guidance, libraries, quarters, mess and supply functions require additional staffing for adequate support of the training program.

The in-service training of technicians and administrative specialists also requires a training and administrative overhead. While trainees do provide service to patients, nevertheless most of their time is expended in training functions. The requirement to train overseas replacements, cadres, or special medical service forces also increases staffing needs. This mission is a special characteristic of military hospitals.

Tactical units such as field and numbered station hospitals are designed and staffed to care for military patients in overseas theatres. Yet in these changing times they are caring for military dependents for whom the authorized staff is inadequate, especially since such hospitals are required to maintain a combat readiness through continuous and intensive training. Accordingly, new missions—tactical or service type—call for additional personnel for their proper accomplishment. For example, medical support for special task forces or training groups may tax hospitals to provide military medical personnel for support in range firing, marches, maneuvers, training problems, or for staffing outlying dispensaries and aid stations.

6. *Research activities,* whether professional or administrative, require additional personnel, facilities, equipment and supplies. In general, research is carried on by highly trained personnel in the large hospitals. This is another indication why large medical centers have increased staffing requirements.

7. *Dispersion.* To those who have served in cantonment type hospitals exending over 50-70 acres it is obvious that a horizontal type hospital has many disadvantages from the staffing point of view. The great dispersion of clinical and administrative services increases greatly the nonproductive time, maintenance, and custodial service. More personnel are needed by nursing, food service, and supply divisions. Vertical hospitals, several stories high, and with efficient elevator service can be operated more efficiently and economically personnel-wise.

Hospitals designed from a functional standpoint can materially improve performance by good positioning of equipment, facilities, and services; and by reduction of inside travel required to get things done. *The proper grouping of outpatient facilities clinics, administrative, and general services can be a significant factor in more economical and effective utilization of personnel.*

8. *Shorter Hours of Work.* Generally, military personnel work 44 hours or more per week. On the other hand, civilian employees are not required to work over 40 hours without overtime pay. A decrease of four hours in the work week requires an additional 10 percent personnel to do the same tasks. The trend in industry and civilian hospitals has been toward a shorter work week and this trend appears to be continuing. Because hospital staffing cannot be provided for peak loads commanding officers are faced with the necessity of expanding the work week of military personnel during winter months in order to meet seasonal peak loads. Improper scheduling of civilian employees so as to cause considerable overlap

in shifts or poor planning of the work they are to do also increases staffing.

9. *Shortage of Medical Officers* is one of the most important factors for delays in examination and treatment, for long waiting periods and back logs, for increased hospital admissions, and for longer patient stay. Experience has shown conclusively that the more skilled personnel are available, the less number of total personnel are needed to provide hospital services. A sufficient number of doctors makes for timely and more efficient preventive medical care, for fewer admissions, and for better medical service. This is especially important at training centers where large numbers of recruits are processed every four months.

10. *High Standards of Hospital Care.* The standards of quality of hospital care maintained by the hospital are determined to an appreciable degree by the caliber and number of personnel available to render service. A high caliber staff is generally recognized by achievements in their particular field; however, they must be supported by an adequate number of technicians, administrative and general service personnel. While it is recognized that the professional service provided is the key determinant of the level of care, other factors such as a friendly reception, sympathetic treatment, good food, and supply services are essential attributes of good hospital care. To provide these to a satisfactory degree requires an adequate staff and facilities. When the number of hospital personnel is unduly reduced, jobs get done in a hurry, mistakes frequently occur, frictions develop, and patients feel they are being treated as cases rather than as human beings. Accordingly, it can be said that it takes adequate staffing to maintain desirable standards of care, and the higher the standards, the more people required.

11. *Poor Management* is perhaps a major cause of overstaffing and unnecessary use of personnel. The following practices generally lead to an increased demand for more personnel:

Policies that lead to packing the hospital to keep up the census.

Policies that lead to indiscriminate use of "emergency admissions."

Policies that lead to scattering of patients in many wards or clinics.

Poor organization of work and lack of supervision.

Methods of operation which are inefficient or out-of-date.

Too many local forms and reports.

Lack of measurement of workloads and poor scheduling.

"Empire-building" and defensive attitude.

Poor communications and duplication of effort.

Lack of personal attention and observation of what's going on.

Poor planning, ineffective direction, and inadequate control of operations.

Failure to observe the spirit and intent of AR 40-680.

Establishment of too many organizational elements.

Failure to make full use of labor-saving devices and equipment.

Section III—Factors Which Tend to Decrease Staffing Requirements

1. *Stabilization of Workload.* One of the most productive methods to minimize operating costs is to stabilize the hospital workload at a level most favorable for operating efficiency. Such stabilization brings optimum utilization of facilities and personnel and may be achieved by:

a. Stabilizing the average daily census as far as is possible and

b. Reducing the total number of operating beds to conform with the stabilized census.

Practical measures which can be taken to stabilize the census include the increasing of interchangeability of beds for various types of patients and the instituting of procedures to level off sharp variations in admission and dispositions. Interchangeability is more feasible when the hospital has many single rooms or cubicles.

Stabilization of occupancy can be achieved to some degree by controlled scheduling of admissions, especially of elective surgical cases. With a short length of stay co-ordina-

tion of admissions and discharges is an important factor in stabilizing the daily census and increasing occupancy. However, the most effective method of eliminating costly empty beds is to close down wards and operate a number of beds as close to the average daily census as is practical.

2. *Command Policies.* Policies relating to patients and hospital may conserve or waste manpower depending on how they are applied in operations and to what extent they are subject to variation by local circumstances. As an illustration may be cited the policy to treat as many patients as possible on an outpatient basis and reduce the number of admissions to hospital. While this is feasible to some degree in all posts and camps, it is less so in training centers where training regiments do not have organic medical service. In this situation, medical officers from the hospital hold sick-call for the trainees. It is not possible to use "quarters" to any degree because trainees are practically "on the run" during their training period. Accordingly, admissions flood the hospital during seasons when respiratory infections are prevalent. On the other hand, with combat-type divisions having organic medical service, the number of admissions to hospital are generally less because of seasoned troops, greater use of placing men in quarters, and more adequate preventive medical measures due to constant observation of troops by medical officers.

Nevertheless, within the limits of policies prescribed in regulations, hospital commanders have considerable latitude in placing into effect policies which will tend to make the best use of available medical personnel while maintaining good standards of medical care. Such policies are directed to control operations and obtain the maximum contribution from professional and nonprofessional personnel. The following operating policies have been found practical, subject to local modifications:

a. The medical officers' time will be conserved to the maximum extent by delegation of duties to ANC, MSC, and WMSC officers and technicians; by providing them support with such personnel to extent deemed appropriate; by relieving them of administrative details through use of clerical personnel and dictating equipment; by not wasting their time in nonessential duties, boards, conferences, and training; by allowing them full participation in the preparation of local medical plans and policies; by providing them with modern medical equipment and supplies; and by stabilizing their workload to the extent feasible.

b. That professional nurses be employed on essential professional and administrative duties, with technicians and clerical personnel performing the nonprofessional tasks.

c. That officers and NCO's be entrusted with delegated authority to organize and direct the work of their subordinates; and be held accountable for good performance.

d. That activities and functions be continually reviewed, consolidated, or eliminated if non-essential.

e. That ambulatory patients be employed to perform light duty about the hospital.

f. That standing orders and operating procedures be documented and periodically reviewed for simplification and improvement.

g. That job descriptions be prepared for all personnel so they know what they are required to do and to whom they are responsible; and that such job descriptions be periodically reviewed and brought up-to-date.

h. That all key personnel give personal attention to the manner of performance of their subordinates and constantly seek ways for improvement.

i. That programs be established for the progressive development of all personnel.

j. That there be advanced scheduling of operations, properly organized and supervised work, and critical appraisal of performance.

k. That for the implementation of command policies, efficient methods of operation be devised and put to practice.

l. That volunteer groups be trained and utilized to extent practicable.

m. That personnel be stabilized in their assignments to the extent possible.

4. *Organization of Work.* Of major importance in achieving effectiveness and economy of operation is the proper organization of work and the methods of operation employed in doing the work.

Through many years of experience the Army has developed sound organization structure for hospitals. New advances in the medical sciences call for new advances in administration. Just as medical research has been the road to success in medicine, likewise experimentation and research in administrative methods is a prerequisite for improved administration. For it is administration that guides and directs the human and physical resources available for accomplishing the hospital's mission.

Accordingly, at each clinical and administrative area supervisors should organize the work of their services or divisions so that it is performed on a scheduled basis and with the fewest number of people.

5. *Methods of Operation.* The following administrative practices have been found practical in increasing the effective and economical utilization of personnel:

a. Preparation of functional organizational charts for each service or division.

b. In professional areas, preparation of standing orders dealing with techniques and duties in the care of patients.

c. In general service areas, development and use of standing operating procedures for the performance of specific functions.

d. For over-all administration, issuance of concise hospital regulations which are necessary for coordination and control.

e. Establishment of good communications throughout the hospital by promoting personal contacts, group meetings, and get-togethers for the discussion of common problems.

f. Grouping and locating related medical or surgical specialties together.

g. Establishing recovery and intensive treatment wards.

h. Continually screening patients for unnecessary hospitalization and moving out of active wards those who do not require daily professional care but can be treated on a quarters, clinic, or outpatient basis.

i. Establishment of centralized services where possible, such as for delivery of supplies and linen; stenographic work; sterilization of surgical items; physical profiling and examination; appointments to clinics; stock records; and accounting.

j. Establishment of a performance analysis and cost accounting system for effective appraisal of operations; adjusting number of personnel to changing workload.

k. Keeping progress charts and continually analyzing problems and procedures.

l. Cultivating harmonious relations with other members of the post general and special staffs and representing the hospital and its needs effectively to them.

m. Conducting in-service training for all personnel to raise their level of competence.

n. Searching for and using labor saving devices and equipment.

o. Training volunteers together with Red Cross workers and using them for appropriate jobs in the hospital.

p. Utilizing ambulatory patients for light duties in the hospital such as office work, courier service, and policing.

q. Standardizing ward and clinic layouts, the placement and storage of equipment and supplies.

Reserve Officers of the Medical Services may earn credit points by attending the 62nd Annual Convention of our Association, November 7-9, 1955.

Eighth Army Medical Service

In Two Parts—Part I

By

LIEUTENANT COLONEL SPURGEON NEEL, MC, USA*

THE development of sound field medical service organization and procedures should be based on periodic reports submitted by observers in the field. This is one such report. It is a factual, panoramic, presentation of the organization, functions and employment of Eighth Army medical units and installations during the interim period immediately following the recent hostilities in Korea. Emphasis is placed on the application of basic accepted principles of field medical service to this particular situation. No attempt is made to resolve controversial doctrinal matters, nor to recommend drastic alterations in existing T/O&E's (Tables of Organization and Equipment). Such matters are more within the province of medical sections of higher headquarters and appropriate teaching and research agencies. Certain deviation from standard T/O&E's and established doctrine will be described and justified, but generalized recommendations for modification will be avoided. This report, and others similar to it, should be evaluated in the light of the tactical and geographical conditions, and other limiting features existing during the reported period. The organization and procedures described represent an effective method of providing medical support to one field army, in one particular area, during one particular period, with one particular mission.

Separate medical units assigned to the Eighth United States Army represent a considerable reduction below those normally allocated a scaled type field army. This basic fact has required considerable deviation from doctrine in the organization, dispositions and utilization of army medical support units and installations. This consideration should be borne in mind during subsequent discussions of the several aspects of army medical support. A detailed listing of currently assigned medical units, or their exact locations, cannot be presented due to security restrictions. Sufficient detail is included to permit intelligent understanding of organization and dispositions.

Until shortly preceding the cessation of active hostilities, separate medical units of Eighth Army were under the direct operational control of the army surgeon. In June 1953 the 30th Medical Group became operational as a central army medical command. At that time all separate army medical units were assigned to the group with the exception of the then two evacuation hospitals and three small cellular detachments attached to major tactical commands. The logic behind the establishment of a central army medical command was the improvement of medical service procedures by complete command control which, in turn, enhances flexibility, efficiency and economy of means. Such an expedient was particularly appropriate in Eighth Army due to the paucity of medical means and the magnitude of the medical support mission. Experience has indicated that a medical group, with minimal augmentation, can function effectively as a centralized medical command. This concept of a centralized technical service command merits further consideration by the Army Medical Service as well as the other technical services of the Army. A complete documented study of the experiences of the 30th Medical Group, emphasizing its advantages and disadvantages, is under preparation, and will soon be submitted for study and analysis.

Initially, the 30th Medical Group comprised 71 separate medical units; increasing to a maximum of 75 units during the opera-

* Plans and Operations Division, Office of The Surgeon General, DA (Formerly, Commanding Officer, 30th Medical Group, APO 301).

tion of the non-repatriate prisoner of war enclosure in the Demilitarized Zone. Currently, the group consists of 58 separate medical units. This decrease in strength has resulted from inactivation of certain surplus units, and reassignment of others directly to Eighth Army for administrative and allied reasons. At this writing the group commands directly the surgical hospitals, the army medical laboratory, the preventive medicine company, the preventive medicine survey detachment, the provisional helicopter ambulance company, the reserve ambulance company, and three separate medical battalions, or a total of 14 units. All other separate medical units are assigned or attached to those just listed.

The 30th Medical Group is not primarily concerned with the development of medical policies, nor are technical consultants included in the group staff. It is concerned with the implementation of policies established by the Eighth Army medical and dental sections. Broad missions are given the group commander, who, in turn, insures their efficient accomplishment through his integrated administrative and operational control over operating medical and dental units. The group commander continuously advises the army surgeon and dental surgeon concerning the capabilities of operating medical and dental units, and assists in the development of organizational, hospital and evacuation policies. Commanders of subordinate operating specialized medical units have direct access to their counterpart on the staff of the army surgeon on purely technical matters, all other administration being directed through established command channels. Commanders of certain special medical units also serve as consultants to the army surgeon, and, as such, have direct access to the surgeon and his staff.

The 30th Medical Group has been singularly successful in its primary management mission. Specialist consultants on the staff of the army surgeon are relieved of many administrative problems and can devote full time to planning, development of policies, and supervision of technical matters. The army dental surgeon is provided with a realistic administrative framework for the implementation of the spirit of AR 40-15. Smaller subordinate operating medical units are assisted by having a major medical command headquarters to coordinate and integrate their functions, take care of their interests and represent them to the army headquarters. The Eighth Army headquarters is particularly benefited in that the number of medical commands immediately subordinate to it has been substantially reduced. Of special interest is the role of the group as a field agency of the Army surgeon in the supervision and coordination of all forms of evacuation within and from the army area, and the integration of area medical service. These will be further described.

Medical Supply

The organization, dispositions and functions of the medical supply system of Eighth Army more closely approximate accepted doctrine than any other aspect of the army's medical service. The headquarters and base platoon of the depot are located in the army maintenance area, taking advantage of the best air, rail and road net in Korea. Two advanced medical supply points, each reinforced with optical repair detachments, are located in the major sub-maintenance areas supporting active US corps. A third advanced medical supply point is located well forward in support of a smaller, but more isolated, troop concentration. Medical supplies are normally received by rail from the base medical depot located in the port area of the Korean Communications Zone (KComZ). Air transport is used, when indicated, not only to the base platoon of the army medical depot, but also to the forward medical supply points. Air transport has proven particularly economical in moving critical items, including those of high unit cost, and those with short expiration dates. When necessary to reduce stocks in pipe line or to meet unforseen emergency requirements, medical equipment and supplies are

flown into the army area directly from the Japan Medical Depot.

Whole blood continued to be a critical item even with the cessation of hostilities. Minimal stocks are maintained at forward medical treatment facilities, with replenishment on call from the base depot platoon or forward medical supply points. Medical helicopters have proven most valuable in rapid delivery of whole blood to meet emergency requirements. The principal source of whole blood for use in Eighth Army is the 406th Medical Laboratory in Japan via USAF aircraft directly to the army area.

A highly effective innovation in Korea is the placement of optical repair support with each US infantry division. One man, assigned to the army medical depot, along with the optical repair equipment normal for a Team GB T/O&E 8-500, is attached to each US infantry division. This support, in each divisional clearing company, has conserved many man days, and has been repeatedly recommended as a desirable modification to division T/O&E's.

The Republic of Korea medical supply system receives its support from the base medical depot located in KComZ. From that point ROKA medical supplies are processed independently from those of the U. S. Army. At all levels, however, assistance and supervision is provided ROKA medical supply agencies by their US counterparts. The above described system works most effectively, has improved immeasurably, and is accepted as one of the most efficient of any of the several technical services. Local procurement of whole blood for use in ROKA medical facilities has been a major problem, but is being alleviated through education and U. S. Army technical and material assistance. Through formal schools, and "on-the-job" training, the U. S. Army medical supply system has provided effective guidance to their counterparts in the Korean Army, and the results have been most gratifying.

Hospitalization

There are three types of hospitals supporting Eighth Army. They are the surgical hospitals, the semi-mobile evacuation hospitals, and the recently activated convalescent "hospital." Hospitals in Eighth Army are generally echeloned one step to the rear, both in mission and in location. This situation is due to the paucity of hospitals on the medical troop list of the army, the nature of the terrain, the disposition of major tactical elements, and the absence of the 750 bed evacuation hospital. Hospital dispositions reflect a compromise between requirements for direct support of forward tactical units, and the necessity for providing coverage in depth for troop concentrations in more rearward areas. Realistic use of manning levels and equipment modification lists have permitted effective use of mobile hospital units in a secondary role as "semi-permanent" installations providing station hospital type support to relatively static troop concentrations.

Eighth Army hospitals are mobile medical units presently occupying semi-permanent plants, but ready to resume their primary direct medical support mission under canvas. One evacuation hospital is located in a converted school building. All other hospitals are established in prefabricated structures erected by the Corps of Engineers. Limited additional equipment of all technical services has been authorized hospitals as required for their present mission. These improved facilities contribute to better professional procedures and greater patient comfort.

The army surgeon has been extremely reluctant to increase the bed capacities of his hospitals beyond that authorized by T/O&E lest they become too sessile and incapable of performing their primary mission. There has been a tendency on the part of some hospital commanders to seek authority to turn in, as excess, certain items of equipment not required for their present interim mission. Such requests are critically reviewed, and no item is turned in which will compromise the unit's mobility or its ability to operate under canvas. Routinely, requests for additional equipment, or requests for authority to turn in "excess" items, include the sentence, "This does not constitute a recommended change in T/O&E." It is considered

unrealistic to recommend T/O&E changes on the basis of a very limited experience in one specific operation. Present T/O&E's, supplemented by logical use of manning levels and modification lists, provide sufficient flexibility for normal medical support missions.

Surgical Hospitals

Currently, all U. S. Army surgical hospitals in Eighth Army are organized and equipped as 60 bed installations as prescribed in T/O&E. This has not always been the case. In the earlier days of the recent conflict, surgical hospitals were augmented with personnel and equipment to provide as many as 200 beds. The attendant loss in mobility of these "MASH'S" was accepted, and the units were considered and utilized as sessile quasi-evacuation hospitals. This expedient was required due to the tactical and medical situation, and, at the time, was completely justified. As the situation became more normal, all surgical hospitals, with one exception, were reorganized as prescribed in T/O&E and were utilized in a more normal role. The one exception was a surgical hospital in name only supporting a major static troop concentration and several forward medical research projects. Recently this installation was converted, in place, into a semi-mobile evacuation hospital. Its T/O&E is now normal for its mission, and the "field expedient" is no longer necessary. This all points up an important principle of field medical service. *One should never hesitate to modify medical units, when absolutely necessary, to perform an essential mission.* The immediate corollary, however, is, that one should return to proven doctrine and accepted T/O&E as soon as it is feasible.

The surgical hospital which was recently converted into a semi-mobile evacuation hospital is now non-operational with no assigned mission due to a lack of professional personnel to adequately staff it. The alternative is to cannibalize other, more vitally needed installations, reducing them to a manning level insufficient for their operation. The course of action elected is considered the most desirable in that the "cost" in equipment and personnel far outweighs the gain in bed capacity. In military medicine one never gets anything for nothing.

The remaining surgical hospitals are deployed in functional pairs rather than on a strictly area basis. Specific locations are oriented on the disposition of supported tactical units with full consideration to terrain and communications nets. It was elected to dispose surgical hospitals in pairs for two reasons. The foremost consideration is combat readiness. Should hostilities resume and movement forward or to the rear become necessary, it is now feasible to close one of each pair and displace it while its partner continues to provide close medical support. Continuity of medical service must be preserved, and a hospital cannot operate while moving. A secondary, more immediate consideration is economy in specialist personnel. Should shortages develop, and they already have, care is taken to insure that at least one of each functional pair is provided with the professional support required by both. This tenet applies equally in the allocation of specialized medical equipment. Certain surgical hospitals have been augmented with specialist personnel and equipment in order to provide ancillary consultation service well forward easily accessible to supported troop units. One surgical hospital has as its primary mission station hospital type service for an established area command.

Visitors in Korea frequently ask the question, "Why are the surgical hospitals assigned to the 30th Medical Group?" There are two reasons for this, one administrative and the second operational. Surgical hospitals, as presently organized, are administratively insufficient and require some intermediate medical command headquarters between them and the field army headquarters. The alternative is to augment the administrative complement of each of the several surgical hospitals, which would be wasteful in critical personnel. Operationally the surgical hospital can philosophically be considered as part of the evacuation system of the field army. According to doctrine, the

criterion as to whether an individual is admitted to a surgical hospital is one of transportability. As presently organized one medical commander has both the means of evacuating patients and also the means of making non-transportable patients transportable. Regardless of the eventual decision in this matter the present system works quite efficiently.

One of the more interesting medical units in Korea is the Norwegian Surgical Hospital, affectionately known as the "NORMASH." This unit is organized and equipped identically with its counterpart in the U. S. Army Medical Service. The unit is staffed primarily with volunteer civilian professional and supporting personnel provided on a rotation basis by the Norwegian government. It is effectively integrated into the Eight Army hospital system through the use of a small table of distribution and allowances (T/D&A) administrative detachment. This expedient, which has proven so efficient in Korea, merits further consideration. It is obvious that, in any future major war, medical units of the several participating powers will be serving side by side. Medical service must be controlled, and such units must be welded together into a smooth functioning, integrated team. The record of the "NORMASH" is a tribute to the men and women who have staffed it and the country which they represent.

Evacuation Hospitals

The evacuation hospitals of Eighth Army are deployed well to the rear in juxtaposition to major static troop concentrations. In addition to receiving patients from local dispensaries, they are in the chain of evacuation of casualties from forward surgical hospitals. This is admittedly contrary to doctrine, but is necessary for several important reasons. There are no 750 bed evacuation hospitals. Surgical hospitals perform a portion of the mission normally allocated to evacuation hospitals. Scarce category surgical and medical personnel are placed at the apex of the functional evacuation triangle in general support of forward medical installations. Major road and rail nets lead to the population centers near which evacuation hospitals are located. There are no general hospitals in Korea, and evacuation hospitals located well to the rear, function as treatment centers precluding unnecessary evacuation. Improved facilities permit better clinical work. This use of evacuation hospitals has greatly enhanced professional procedures and has increased the holding potential of Eighth Army medical service. Greater economy in the use of mass evacuation means, *i.e.*, rail and air, has also been effected. Necessary depth has been provided in a theater noted for fluidity and uncertainty of its tactical actions.

Special Treatment Centers

Two of the evacuation hospitals are located in the army maintenance area. One serves as a "surgical center" and the other as a "medical center." This arrangement permits concentration of highly technical personnel and greater economy in their use. The third member of this specialized treatment complexity is the army neuropsychiatric treatment center. While not truly a "hospital," this facility bears consideration at this time. The nucleus of this neuropsychiatric treatment center is a psychiatric detachment (Team KO T/O&E 8-500) with a medical holding company attached for housekeeping and administrative support. The center receives neuropsychiatric patients referred from division neuropsychiatrists and separate army medical installations. A psychiatrist is assigned to one evacuation hospital located toward an isolated flank of the army but none is found in other army medical installations. Maximum utilization is made of division neuropsychiatrists in conservation of manpower with general support provided by the special treatment center. Psychiatric patients who become manifest in forward surgical hospitals are frequently evacuated "forward" to division neuropsychiatrists for evaluation and treatment to conserve manpower and take some of the load from the central treatment facility.

A neurosurgical detachment is used to

augment the capability of an isolated surgical hospital located well forward toward one flank of the army. Rearward neurosurgical support is provided by attachment of a neurosurgical detachment to the evacuation hospital which has been designated as the surgical center. Professional personnel assigned to other surgical hospitals are limited to general surgeons, internists, radiologists, anesthesiologists and general duty medical officers. Specialist personnel, as indicated above, are centered in supporting evacuation hospitals. These include orthopedic surgeons, otorhinolaryngologists, cardiologists and ophthalmologists. The organization of the hospital system of Eighth Army permits the most effective utilization of specialist personnel of all categories.

Hospital Ship

Since the cessation of hostilities, the United States Navy has maintained one hospital ship anchored immediately off-shore, well forward, in direct support of divisional medical facilities on that particular flank. This floating installation has provided invaluable support for Eighth Army infantry units as well as hospitals. The superior facilities and excellent professional staff of these ships have been exploited to the fullest extent in the care of Army as well as Navy and Marine personnel. Due to the peninsular nature of the Korean campaign it has been possible to keep hospital ships well forward along what is generally considered the "line of evacuation hospitals." In medical planning and projection of requirements, Eighth Army has always thought of hospital ships as additional hospitalization rather than a means of evacuation. The integration of the hospital ship into the hospitalization system of Eighth Army has been a prime example of the inter-service cooperation which has characterized the medical service of the entire Korean campaign.

Convalescent Center

Recently a convalescent "hospital" became operational in the Eighth Army area. While its official designation includes the word "hospital," this 500 bed facility is adapted from the T/O&E "Convalescent Center" authorized army or communications zone. It was established to increase the holding potential of Eighth Army medical service to a level commensurate with the surgical potential of definitive hospitals. Patients who no longer require definitive medical treatment, yet who are not ready for return to full duty status, are moved to the convalescent facility until completely ready for return to their parent units. The emphasis within this facility is on holding and supportive treatment, and no formal physiotherapy or rehabilitation is envisaged. The professional potential of this installation approximates that of one hospitalization unit of a field hospital.

The establishment of this facility after the cessation of hostilities is another example of the continuous effort to adapt the medical service to the problem. The army's medical service was capable of much more in the way of definitive treatment than its bed capacity would allow. The convalescent center is the best manner of providing additional bed capacity with the least expenditure of professional personnel. It is medical economy of the highest sense. It has, and will continue to conserve man days and will reduce the amount of extra-army evacuation as well as supporting hospital beds required. Prior to its establishment, clearing companies were utilized to receive such convalescent patients and hold them pending return to full duty. The convalescent hospital is better suited as it is organized and located specifically for this mission.

UN Forces Hospitalization

Hospitalization for troops of the Republic of Korea Army (ROKA) is provided by two types of installations within the Eighth Army area. ROKA surgical hospitals are located well forward in direct support of ROKA divisions. Each has a patient capacity of 120 beds, while personnel, equipment and transportation are considerably reduced below that allocated to their US Army counterpart. Normal administration, personnel and

supply matters are controlled by established ROKA command headquarters with supervision by medical representatives of the Korean Military Advisory Group (KMAG). Tactical operations and integration is controlled by the Eighth Army surgeon, with 30th Medical Group as the field agency. These are extremely effective units, and their professional work is excellent by Korean standards. These forward surgical hospitals are supported by ROKA "army hospitals," large fixed installations similar to the general hospitals of the United States Army. Inasmuch as the ROKA has always operated within its own "zone of the interior," evacuation hospitals have not been used to date. Evacuation hospitals are included in future plans for the ROKA, but evacuation at present is directly from surgical to general hospitals. One ROKA clearing station, located in direct support of the majority of ROKA major tactical units, has been reinforced with a neurosurgical team and functions as a forward neuro-surgical center.

Other components of the United Nations forces with Eighth Army are supported by a variety of medical installations, standard for their own service, and proportionate to the supported troop strength. Until recently, all but the U. S. Marine division evacuated to U. S. Army hospitals with the Marines evacuating directly to the U. S. N. hospital ship. Presently, all UN forces, except ROKA, evacuate to U. S. Army evacuation hospitals such patients as exceed the capabilities of their own organic medical support.

Evacuation

To fully comprehend the evacuation system within Eighth Army, one must appreciate the terrain, communications net and disposition of major tactical elements. All standard means of evacuation are utilized within the army area. Each particular mode of medical evacuation is exploited to the extent of its capability, and each complements others minimizing undesirable restrictions and limiting features.

Ambulance Evacuation

Ambulance evacuation to the rear of divisional clearing stations is the mission and function of two operating separate medical battalions. Available ambulance companies are allocated these two medical battalions on a basis of supported troop strength, area serviced, terrain and road net, and other means of evacuation available. The battalion responsible for evacuating the larger portion of the army area, with a poor road net and no forward rail evacuation, is allocated approximately four times the ambulance support as the other which operates under more favorable conditions. Responsible battalion commanders maintain continuous liaison with supported division and corps surgeons, and allocate missions to separate ambulance companies as indicated. Ambulance evacuation is normal between tactical units and supporting surgical hospitals forward, and between unit dispensaries and supporting hospitals in the rear. Evacuation between forward surgical hospitals and evacuation hospitals, and between army and supporting medical facilities is normally by rail or air, except for those installations not serviced by rail or air. As accepted in doctrine, returning ambulances are incidentally utilized to remove duty personnel from medical installations and return them to their parent organizations. Medical transportation is not scheduled or programmed for normal movement of personnel returning to parent units.

Rail Evacuation

Rail evacuation is available well forward on one flank of the army, and as far forward as a major sub-maintenance area on the other. It is the primary means of moving patients from Eighth Army to supporting medical installations located in KComZ. An Army clearing and holding facility is located at each of the forward terminals of rail evacuation, and an evacuation hospital serves as the consolidation and screening point for patients being moved south into KComZ. With the cessation of hostilities and a re-

duced requirement for moving large numbers of casualties, it was found that the standard ambulance train was inefficient. It is uneconomical for the Transportation Corps (the operating agency of rail movements) to "cut a path" for ambulance trains carrying less than 100 patients. This situation gave rise to two major medical problems. Either patients were held unduly long awaiting accumulation of an "economical" load, or there was a tendency to over-evacuate patients for the sole purpose of constituting such a load.

The problem was speedily solved by substitution of "rail busses." These are standard 32 passenger busses, modified with so-called "Evans Converters" to permit their use on rails as well as roads. These smaller vehicles, capable of transporting either 32 ambulatory or some 14 litter cases, are used extensively within the army area. They are used to evacuate transferees and consultations from forward medical facilities to supporting hospitals in the rear. Ambulance trains are reserved for the longer run between army and KComZ. Such trains are not scheduled, but are requested when the number of patients awaiting evacuation justifies their use. They have been used only infrequently since the establishment of the convalescent center. The Eighth Army agency responsible for coordinating rail evacuation both within the army area and to its rear is the 30th Medical Group. Direct liasion is affected between the group and an advanced detachment of a KComZ hospital train unit located in the army maintenance area. KComZ (Transportation Corps) operates the trains and rail busses, and provides medical personnel to accompany patients on the trains.

(To be concluded)

GENERAL KESTER HEADS AMERICAN VETERINARY MEDICAL ASSOCIATION

Brigadier General Wayne O. Kester, Assistant for Veterinary Services, Office of the Surgeon General, Headquarters U. S. Air Force, was elected president-elect by the American Veterinary Medical Association at their 92nd annual meeting in Minneapolis.

The association is composed of some 18,000 veterinarians in North and Central America. Election to its presidency is considered to be one of the highest honors that may come to a veterinarian.

U. S. Air Force Photo

BRIG. GENERAL WAYNE O. KESTER, USAF (VC)

EDITORIALS

Our Convention

WE HAVE written before in this column about our 62nd Annual Convention which is to be held at the Hotel Statler here in Washington, November 7, 8, and 9. Members have also received a special letter telling about the convention and especially advising about the events for the ladies with a request that reservations be made. We feel that a few words more are necessary.

This Association, like other organizations, has a convention for several reasons. One of those reasons is that of accomplishing business that must be brought before the membership as a body. Another reason is to provide an instructive program which will make the trip to the convention well worth while. In this we feel we have been especially successful this year. This 62nd Annual Convention promises to be one of the best that we have had. Major General Martin, Brigadier General Wood and Colonel Saylor, with their committees, have been working hard to make it well worth while to attend.

In this issue of MILITARY MEDICINE you have the program and we urge you to study it carefully. If you have not already planned to attend you will surely want to now after reading these very timely subjects. For those who simply cannot come to Washington we hope to bring to you in these printed pages at a later date some of the papers that will be presented at the convention. Then there is another reason for coming to this meeting. That is the opportunity it affords for seeing old friends. With over 1,700 registered last year, and an indication of topping that figure this year, there will be many opportunities for renewing acquaintanceships. The evenings, except for the Honors Night Dinner on November 9, are open for these friendly get-togethers.

The ladies will be well taken care of as evidenced by the list of activities. In addition there will be time for them to do some shopping if the husbands will not hold the purse strings too tightly. With the exception of the luncheon and Cinerama the only other charge for the trips will be for transportation which will be in chartered busses for those desiring it. This will be at a very nominal fare.

We must, of course, not forget the commercial and scientific exhibits. Here you will be acquainted with some of the latest things in the pharmaceutical and instrument fields, and see some of the latest books in the medical field.

Well, enough of this chatter. We shall see you at the Convention.

Specialization

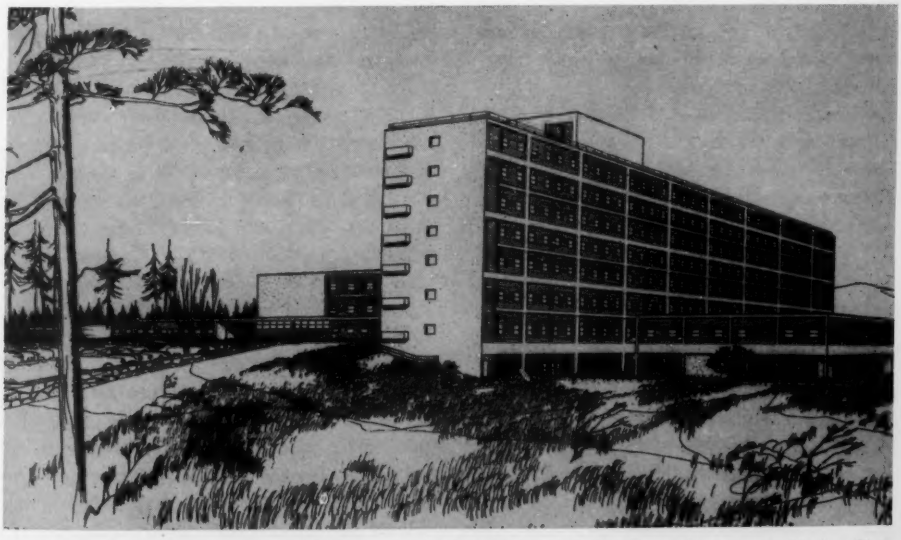
IT MUST have been somewhat of a surprise recently to Brigadier General Edward J. Kendricks, USAF (MC), Commanding Officer of the School of Aviation Medicine at Randolph Field, Texas, when he read over the questionnaires of the young physicians entering that school, to learn that the majority of them wanted to be general practitioners of medicine.

General Kendricks, as a number of us, came into the military service at a time when the young doctor was expected to "generalize" before he "specialized." World War II changed all that, it seems, and about all some of us who were forced into the administrative field heard thereafter was, "I am not interested in that because I am going to work for my Board in . . ." So when one reads of young doctors who want to be general practitioners he becomes hopeful again that the family doctor idea may again be captured by the medical profession as well as by the American people.

While there can be no argument against specialization we feel that "generalization" before "specialization" is better for the medical profession and for the public. General Kendricks has expressed our views when he said, "In my opinion, a man becomes a better doctor if he spends some years in general practice before he narrows his interest to a specialty." He speaks from experience as the General did just that. After general medicine he went into the field of neuropsychiatry and aviation medicine.

We might mention here that in the military service there is an opportunity to become well grounded in general medicine and then study for one of the specialties if so inclined. While doing this the pay and allowances go on. This same opportunity is not so readily available in civilian life. There a doctor who would follow the same route toward specialization would be compelled to leave his practice for the advanced training in the line of his interest. This is costly in time and money. We might add that in some communities it might be difficult to return as a specialist. So we feel that for the doctor who wants to be well grounded in general medicine and still work toward specialization the military service affords that opportunity.

The general physician is the backbone of the medical profession. All others while extremely important do not have the importance of the general practitioner. He is the one that should be called first, and usually is. He must be well qualified to maintain the confidence of his patients. His experience broadens as his interest in his patients broadens. He must, of course, know his limitations, and when they are reached he should then consult with the specialist who has narrowed the field of medicine for himself after having roved in the large field of general practice.



The above sketch shows the new Air Force hospital at Elmendorf Air Base, Anchorage, Alaska. This hospital was dedicated in early September and will be used by the three services of the Armed Forces.

Around the World

By
CLAUDIUS F. MAYER, M.D.

PERUVIAN SURGEONS, in the country of great contrasts in altitudes, have ample opportunity to notice the difference in postoperative behavior that distinguishes the highlander from the lowlander. Most people who are living in villages 10,000 feet or higher above sea-level have more than the average number of red cells in their blood; yet, the level of their blood-platelets is not influenced by the high altitude. Thus, with a relative deficiency in platelets, *the highlander is liable to bleed profusely* under the surgeon's knife. It is therefore customary to make the surgical patient slightly anemic by a preoperative bloodletting, which is a wise precaution against excessive bleeding during and after the operation. There is but a small group of persons who remain anemic at the altitude of the Andes. They are also mostly in lack of oxygen who cannot be easily put to sleep with the usual general anesthetics and, once anesthetized, need the longest time for recovery of consciousness.

The affairs of *public health and social welfare* are in good shape *in Venezuela,* according to the Minister of Health. The country has excellent medical facilities. The 11-story University Hospital at Caracas has 1,100 beds, and its construction and equipment is a monument to American, German and Italian industrial progress. Moreover, all provinces were provided with small hospitals of their own during the past fiscal year. During the same period, there were also established two neuropsychiatric centers, three maternity hospitals, several child-welfare centers, two new sanatoria for the tuberculous. Venezuela now has 13 such sanatoria, and 23 antituberculosis dispensaries. The lepers are taken care of in two special hospitals (with 600 beds) and by 107 antileprosy dispensaries. During last year 87 new cases of leprosy were detected.

Venezuela is a huge country, with an area of almost 400,000 sq. miles, inhabited by 8,000,000 people. It is partly civilized, partly an unexplored, virgin forest. In 1946, one in every 1,000 Venezuelans was a malaria patient. Today, there is hardly one sick with malaria among a hundred thousand. Last year there was a revival of the old evil, yellow fever, which caused 28 deaths in the Eastern Zone and near the petroleum lake of Maracaibo.

It is stated that this small *outbreak of yellow fever* came to Venezuela from Trinidad where the epidemic appeared in the fall months of 1954. *Aedes aegypti,* the yellow fever mosquito, is still prevalent in large parts of the world, including areas of the South in our own country. The PanAmerican Sanitary Bureau made it its task to review the present knowledge on the yellow jack and to coordinate the American control of the disease. The ultimate goal is the extermination of Aedes aegypti.

The first *Brazilian plant for refining uranium minerals* and producing metallic uranium was constructed in the region of Pacos de Caldas, in the State of Minas Gerais. The plant will also serve the nuclear experts. The atomic studies are further helped by the building of a cyclotron at Niteroi. It is stated that Minas Gerais is particularly rich in radioactive minerals.

The Indian Ministry of Commerce appointed a Pharmaceutical Enquiry Committee in 1953 in an effort to put *the pharmaceutical industry of India* upon a self-sustaining basis. The Committee just published its report for 1954. It seems that the effort to achieve self-sufficiency has been successful on the production line of medicinal substances. A penicillin factory was opened at Pimpri where various antibiotics are also manufactured. There are DDT factories at Delhi and Alwaye. A quinine factory oper-

ates in the Anamalais; it opened on 14 May, 1955. This is the third such plant in India. During World War II enormous quantities of quinine were needed, and the Madras Government ordered a large-scale expansion of the Cinchona plantation on the Nilgiris. A factory at Naduvattam, Madras, has been working for quinine production since 1871. Another quinine factory is active in West Bengal.

Rauwolfia became very rare in the Himalayan region. Hence a team of botanists started to cultivate the plant in West Bengal, Assam, Jammu and Kashmir on a fairly large scale, and the Forest Research Institute at Dehra Dun is also making good progress in this direction. With all these efforts a modern Indian Pharmacopoeia is still but in the making.

From the Bengal Immunity Research Institute, Calcutta, comes the report of an observation which might caution those who use iron preparations for intravenous medication. It seems that the *lethal dose* of any particular sample *of intravenous iron varies with the season.* A dose which is low in toxic manifestations during winter may cause high mortality in the heat of the summer months. In the autumn the degree of iron tolerance is again increased.

Such seasonal variation in the reactions of the human body had been observed many times. For instance, it was just in the summer of last year that two Philadelphia doctors lectured on the *seasonal* incidence of hemorrhage from peptic ulcer. According to their notebooks, during a period of five years duodenal ulcers preferred to bleed in the "R" months, from October to March, while gastric ulcers mostly bled in the first half of the year.

Such findings should make us cautious about the interpretation of medical statistics. Statistical methods have been legitimately applied in various fields of medicine. Statistical data were successfully used by Semmelweis to prove the etiology of puerperal fever. Statistics were recently used more and more often in pathogenetical studies because the experimental methods are either too slow or too disappointing and inefficient. The revival of statistics in medical research produced the recent world-wide scare of bronchial cancer among tobacco smokers.

A recent study of an Uppsala professor proved that, according to Swedish statistics, bronchial cancer is also very frequent in printers. Apparently the printing ink contains certain carcinogenic substances (as this had been already proved in 1929 by Steinbrück's experiments). An American author (E. L. Wynder), writing in a British journal, also tried to show with (manipulated and interpreted) statistics that cervical cancer would depend on certain external factors such as too early initial defloration and poor hygiene of the husband. Hence, he suggested universal circumcision of all male children as a radical prevention of cervical malignancy (He asserted that 85% of all American boys born in hospitals were circumcised anyhow).

There is a growing number of unemployed British doctors. There are about 200 applications for each vacant job in the United Kingdom. On the other hand, there were some 60,000 people per doctor in Nigeria, and 71,000 in the Cameroons. Things are more difficult for the young British doctors because they do not want to enter hospital service. They stay rather in general practice. Hospitals in the provinces are therefore not fully manned, especially those which are remote.

An English doctor (L. D. Housden) just published his book on *The Prevention of Cruelty to Children* (Lond., 1955). It is a major document to be read by all American doctors who are interested in the social conditions of our times. According to the English definition, "any child who is frequently unhappy is the victim of cruelty." The main aspects of such cruelty are drink, moral danger, mental deficiency of a parent and of the child, neglect, etc. The major causes of unhappy childhood seem to be the same the world over:—haphazard marriages and mothers who are not spending enough time

with their children. Lack of parental discipline is the cradle of juvenile delinquency and adult crime.

South African reports on *the causes of endemic goiter* make it certain that there are many substances in the environment of man which are able to produce (by their presence or absence) enlargement of the thyroid gland. Lack of iodine in food and water is only one of the causes of goiter; this mineral deficiency can be remedied by the universal use of iodized salt. In the North-Western Cape Province, however, endemic goiter is chiefly due to the presence of harmful quantities of fluorine in the drinking water. A similar effect of fluorine was also reported in England and in the Punjab. In those areas the prophylactic use of iodine would be hardly successful.—This news came just about the same time when Cairo, the capital of Egypt, had decided to fluoridate its water supply that will serve more than 2 million people. The source of Cairo's drinking water is the Nile.

The *First International Congress of Biogenetics* was held last April in Rome. The participants discussed the role of various substances responsible for the origin and the end of Life. A French biologist suggested that the embryo's body contains true gelatin. A professor of Istambul persuaded his audience that true gelatin is beneficial for the prevention of senile decay and for the prolongation of life. Gelatin could be perhaps the chief *factor of longevity*. As first international congresses usually do this meeting also suggested the creation of a new institute, the Academy of Biogenetics, with headquarters in Paris. Next year the biogeneticians will meet at Munich.

An ophthalmic survey in a district of Western Australia revealed last year that trachoma, though considerably rare, was the most pressing eye problem. It accounts for 64% of double blindness, and for another 9% jointly with cataract, leprosy and injury. It was also the cause in 15% of single-eye blindness. Cataract is relatively infrequent in Australia, owing perhaps to the high-protein diet of the aboriginal.

Speaking of cataract reminds us of the current experiments of a Guatemalan physician. The doctor announced that in a historic Indian plant he found a sure remedy of cataract. The plant, called "Santa Apollonia," has been used for centuries by the natives against all types of eye trouble. The doctor began his experiments in 1952 on dogs and cats. Further trials will show whether his discovery is of any lasting value.

Our present *laboratory instruments are* so *perfect* that in case of any disease they show a very wide range of changes in the humoral make-up of the organism, according to a biochemist member (Wuhrmann) of the Swiss Academy of Medical Sciences. There are many different pathological conditions where the chemical constituents of the blood and body fluids are similarly altered. The humoral composition of the body can therefore hardly be used for the recognition of specific diseases. It just shows the grade of readiness to react. Hence, "isochemistry" does not necessarily mean "isogenesis"; or, in plain language, no diagnosis should be based upon the findings of the biochemical laboratory alone.

The dream of a push-button diagnosis will never be realized. Yet, doctors will try out everything which may be recommended along that line. An Italian physician (Nejrotti) believes that he found a new, very simple diagnostic test for biliary diseases. One has to press upwards with the finger at a 1-cm long area, situated along the LEFT costal margin between the midclavicular and the anterior axillary lines, and if the patient feels a sharp pain, he must surely have some lesion of the liver or the gallbladder, the Italian doctor asserts. Since this 'sure' sign is elicited on the side of the body where there is no liver he aptly called it *"Signum dolens contralaterale"* (Contralateral painful sign) . . . *Multa paucis!*

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ASSOCIATION NOTES

Timely items of general interest are accepted for these columns. Deadline is 3rd of month preceding month of issue.

Department of Defense

Ass't Secretary (Health & Medical)—HON. FRANK B. BERRY, M.D.
Deputy Ass't Sec'y—HON. EDW. H. CUSHING, M.D.

FIRST UNIFIED MILITARY HOSPITAL

The first unified military hospital to serve all branches of the armed forces at Elmendorf Air Force Base at Anchorage, Alaska, was dedicated on September 4. The ceremonies opening this 400-bed hospital were attended by Dr. Frank Berry, Assistant Secretary of Defense (Health and Medical); Major General Silas B. Hays, Surgeon General of the Army; Rear Admiral Bartholomew W. Hogan, Surgeon General of the Navy; Major General Dan C. Ogle, Surgeon General of the Air Force; and Brigadier General Earl L. Maxwell, Alaskan Air Command Surgeon.

The first troops in that area arrived in June 1940 after a hasty departure from Seattle, Washington. Colonel (later General) Buckner with this group as a nucleus formed the Alaska Defense Command. A cantonement type hospital was occupied in November 1940 about the time of the arrival of more troops. From that time on the growth of the Anchorage area and the military reservation has been a rapidly increasing one.

SELECTIVE SERVICE CALL

The Department of Defense has requested the Selective Service System to provide the Army with 10,000 men during the month of October. The Navy, Marine Corps, and Air Force have not requested any men from the Selective Service for that month.

RESERVE CREDIT POINTS

The actual effect of a recent ruling by the Comptroller General of the United States, as regards Reserve retirement points earned for service, has not been fully determined at this writing. The Comptroller has taken the position that to award the reservist points for his year of Federal service, while at the same time granting him points for active duty for training is actually giving him double credit and contrary to the provisions of the Armed Forces Reserve Act.

It is possible that reservists who have earned between 13 and 35 Active Duty for Training points during a year will be permitted to count only 14 retirement points (rather than 15) for Reserve service.

The Department of Defense and the Army have filed a *reclama* on the retroactive application of the Comptroller's decision.

In the future all reservists should so arrange their military training program as to earn fifty points without including more than 14 points for service, if they also include 15 points for active duty for training.

DEPUTY DIRECTOR AFIP

Colonel Dwight M. Kuhns, MC, U. S. Army, has been named as Deputy Director of the Armed Forces Institute of Pathology.

The policy of rotation of the Directorship among the Army, Navy and Air Force left a Deputy Directorship open to the Army when Brig. General Elbert DeCoursey, MC, U. S. Army was succeeded by the present Director Captain William M. Silliphant, MC, U. S. Navy.

Colonel Kuhns, as Army Deputy Director

comes well qualified for the position. His assignments in the Army have been entirely in the field of pathology and laboratory service. During World War II he was commanding officer of the 19th Medical General Laboratory and pathology consultant to the Southwest Pacific Theater.

Colonel Kuhns is a member of the American Medical Association, American Society of Clinical Pathologists, College of American Pathologists, Secretary of American Public Health Association Laboratory Section, and a member of the Washington Society of Pathologists.

Army

Surgeon General—MAJ. GEN. SILAS B. HAYS

Deputy Surg. Gen.—BRIG. GEN. JAMES P. COONEY

NEW CHIEF OF NURSE CORPS

Colonel Inez Haynes was sworn in on October 1 as the new chief of the Army Nurse Corps. She succeeded Colonel Ruby F. Bryant, whose four-year statutory term as chief expired on September 30.

Army Photo

COL. INEZ HAYNES, ANC
(Photo taken when Lt. Col.)

Colonel Haynes is a native of Texas. She graduated in 1931 from the Scott and White School of Nursing, Temple, Texas, and entered on active duty in the Army on December 1, 1933 with Fort Sam Houston as the first station. During World War II she served in the Pacific Theater. This past June she graduated with distinction from the University of Minnesota, receiving a bachelor of science degree in nursing. For the past few months she has been filling the position as deputy chief nurse.

MEETING OF ARMY SURGEONS

There was a meeting of Army Surgeons in the office of The Surgeon General September 15-16 to discuss problems of the Army Medical Service. Those attending were: Brig. Gen. H. W. Glattly, First Army; Col. F. P. Kintz, Second Army; Col. R. G. Prentiss, Jr., Third Army; Brig. Gen. L. H. Ginn, Fourth Army; Col. R. E. Peyton, Fifth Army; Col. R. E. Hewitt, Sixth Army; and Col. C. D. Goodiel, Military District of Washington.

DOCTOR SHORTAGE

There is now a critical shortage of doctors in the Army. This is a matter of major concern to the military establishment. The Army Surgeon General declared in a recent address that doctors resign at an alarming rate: "Our resignation rates have reached an alarming proportion. During the past two years under our present relaxed resignation policy, 2% of the eligible colonels, 23% of the lieutenant colonels, 66% of the majors, and 76% of the captains chose to resign." Various reasons are brought up for this trend. The low rate of salary is obviously only one of them.

ASSISTANT TO SURGEON GENERAL

Colonel Clinton S. Maupin, MC, a nuclear energy authority has been named as a special assistant to the Surgeon General of the Army.

While serving with the Army Medical Corps at the Sternberg General Hospital in

Manila in 1941 Colonel Maupin was captured by the Japanese and was held as a prisoner of war for forty months.

Colonel Maupin is especially qualified for this position as he studied for one year (1948-1949) at Reed College, Portland, Oregon, and for four years at Sandia Base, New Mexico, where he was staff surgeon of the Field Command of the Armed Forces Special Weapons Project.

SGO ASSIGNMENT

Colonel James P. Pappas, MC, is the new Chief of the Environmental Hygiene Branch, Preventive Medicine Division, Surgeon General's Office.

Colonel Pappas received his medical degree from Tufts Medical School, in 1934, and a master of public health degree from Harvard School of Public Health in 1952. He was Chief, Public Health Branch, Korea Civil Assistance Command in Korea from October 1952 to February 1954.

ASSIGNED TO SURGEON GENERAL'S OFFICE

Colonel James H. Mackin, MSC, has been assigned as Chief, Medical Service Corps and Warrant Officer Assignment Section, Surgeon General's Office.

Colonel Mackin was executive officer of the Walter Reed Army Medical Center, prior to his new assignment. A native of Madison, Wisconsin, Colonel Mackin served in the Wisconsin National Guard from 1928 until entering on active duty in the Army in 1941. He served in the Pacific Theater during World War II.

COLONEL BRYANT TO EUROPE

Colonel Ruby Bryant, whose four-year term as Chief of the Army Nurse Corps expired on September 30, has been assigned to Headquarters U. S. Army Forces, Europe.

AVIATION SECTION CHIEF IN SGO

Major James D. Davenport, Jr., MSC, is acting chief of the aviation section in the office of the Surgeon General. He is a former Infantry officer and Army aviator. Major Davenport has the distinction of having received 47 awards, among which are the Distinguished Flying Cross, the Combat Infantry Badge, and the Purple Heart.

CHIEF, HEALTH NURSING BRANCH

Captain Elizabeth A. Pagels, ANC, has been appointed as Chief of the Health Nursing Branch, Preventive Medicine Division, in the Office of the Surgeon General.

This new position was created to provide central control for the Army health nursing service program conducted at military installations. The first program of this kind was initiated at Fort Devens, Mass., in 1949. It is primarily concerned with the prevention of illness among the dependents of military personnel by instructing them in good health practices.

MEDICAL MEETING WRAMC

The Surgeon General's monthly medical meetings will be resumed on October 20 when Dr. Brian Blades, Chief of the Surgical Department, George Washington University speaks on "The Hiatal Hernia."

The meeting will be held in the Sternberg Auditorium, Walter Reed Army Medical Center at 8:00 p.m. on the date mentioned.

OBSTETRICAL NURSING COURSE

The second Obstetrical Nursing course of 22 weeks at the Walter Reed Army Medical Center has six Army nurses enrolled. They are: Captains Margaret Cannon, Anna D'Zurko, Bertha Keith, Patricia Anne Ryan, Margaret Stonaker and Lena M. Tague.

The Director of this course is Major Peggy G. Jones. There is an affiliation with the Catholic University, and the course carries 18 semester hours credit toward a degree at that institution.

EXECUTIVE OFFICER WRAMC

Colonel Dale L. Thompson, MSC, has succeeded Colonel James H. Mackin in the position of Executive Officer of the Walter Reed Army Medical Center. Prior to this assignment Colonel Thompson was Execu-

tive Officer at the Landsthul Army Medical Center, Germany. He has also served as chief of Administration at the Medical Field Service School, Fort Sam Houston, Texas.

MSC NUCLEAR CHEMIST

Recently appointed in the grade of first lieutenant in the Medical Service Corps, Ariel G. Schrodt, attended the closing sessions of the Atoms for Peace conference in Geneva. Lt. Schrodt is on duty at the Army Medical Service Graduate School, Walter Reed Army Medical Center. He received his bachelor of science degree in 1947, his master of science degree in 1949, and his doctor of philosophy degree in 1954, all from the University of Chicago.

MEDICAL AVIATION BRANCH BAMC

Major General William E. Shambora, commanding the Brooke Army Medical Center, has announced the appointment of Major John W. Hammett as chief of the newly-created Medical Aviation Branch at the Center.

The branch has been set up under the medical center's Plans and Operations Division to take care of all emergency evacuation of patients for Brooke Army Hospital for a radius of up to 150 miles. The unit's two H-13 helicopters will be based at the Brooke heliport.

Major Hammett began his military flying career in 1940, flew combat missions in Europe as a flight sergeant with the RAF in the early years of World War II, and in 1942 transferred to the U. S. forces, serving as an artillery liaison pilot in North Africa and Italy during the remainder of the war. He was a helicopter pilot in Korea in 1952-53, and was air officer for the 25th Infantry Division in the "Punch Bowl" area of Korea.

Associated with Major Hammett in the new branch will be First Lieutenant Ira L. Isch, also a helicopter pilot.

LABORATORY CHIEFS

Colonel George J. Matt, MC, formerly Chief of the Laboratory Service at Tripler Army Hospital has been assigned to Brooke Army Hospital in a similar capacity.

At Tripler Colonel Matt was succeeded by Lt. Colonel Harold E. Shuey, who has been on duty at Fort Baker, California.

UROLOGY CHIEF AT TRIPLER

Colonel R. Townsend Artman, MC, is the new Chief of the Urology Service at Tripler Army Hospital in Hawaii. He relieved Colonel Louis K. Mantell, who has been assigned to the Brooke Army Medical Center.

KOREA HONORS ARMY DENTIST

Col. John S. Oartel, Chief of Dental Service at the U. S. Army Hospital in Tokyo, has been made an honorary professor of the Seoul National University, Korea. The appointment was in recognition of Colonel Oartel's efforts in helping rebuild dentistry in Korea during the postwar period. Col. Oartel was assigned to the Korean Civil Assistance Commission in January 1954. He helped establish and equip a 20-unit modern clinic at Seoul National University.

SYMPOSIUM FOR RESERVISTS

A dentistry symposium for dental reservists of the Army and Air Force will be held October 17-18 in the Harmon Armory, at the Presidio, San Francisco, in conjunction with the annual meeting of the American Dental Association. Colonel Kenneth F. Fulton, Sixth Army Dental Surgeon, will preside at the sessions.

Retirement point credits will be allowed dental reservists who attend the symposium. They should make certain that they are registered for such credits.

CLASS IN ADVANCED DENTISTRY

The 14th class in Dentistry Advanced, which is a sixteen week course for dental corps officers of the Army and Air Force is now in progress at the Army Medical Service Graduate School at Walter Reed Army Medical Center. Students are: Lt. Col.

George Blanchard; Majors Benj. K. Ammenwerth, Albert J. Cardamon, James E. Cassidy, James K. Foster, Jr., Chas. G. Kendall, James E. Lancaster, Walter M. Ormes, Jr., Leonard K. Schreiber, Chas. R. Schroeder, Kenneth W. Thomasson, and Richard D. Wakeham, all of the Army; Lt. Col. Alfred E. Brandt; Majors John A. Chapman, Lyndon S. Krause and Wm. Z. Master of the Air Force; Capt. Mahmud Husain of the Army of Pakistan; and Capt. Yu-Ling Tan of the Chinese Nationalist Army.

Brig. General Arthur L. Irons is Director of the Dental Activities at the Center, and Colonel Thomas A. McFall is Director of the Dental Division at the School.

RESERVE DENTAL OFFICER TRAINING

The 805th Hospital Center, an Army Reserve Unit which trained at Fort Belvoir, Virginia, during the summer, was assisted in their training by Colonel Gerald J. Collins, Dental Surgeon of the Military District of Washington, and Lt. Colonel Ernest J. Fedor, Station Dental Surgeon at Fort Belvoir.

Subjects discussed were "Activities of the Dental Division (Surgeon General's Office)," "Utilization of Dental Officers in an Atomic Disaster," "Prosthodontics," "Dental Research and Development," and "Emergency Treatment of Maxillo-Facial Injuries."

VETERINARIANS WIN FIRST PRIZE

Brig. General Elmer W. Young, Chief of the Army Veterinary Corps, has received many messages of congratulations on the first prize awarded to the Corps' exhibit at the 92nd annual convention of the American Veterinary Medical Association which was held in Minneapolis on August 14-18.

The exhibit depicted the radio contamination of food and food-producing animals possible in an atomic attack and the gross and microscopic pathological changes in the tissue of animals subjected to irradiation. A Geiger counter was set up to enable visitors to determine for themselves the radio-contamination of several different kinds of food.

MAJOR GEARIN RETIRES

Major Helen Burns Gearin, World War II Director of Medical Department Dietitians, retired from active duty August 31, culminating a career with the Army Medical Service which began in 1928.

When relative military rank was granted to Army dietitians in December 1942, Major Gearin, then chief dietitian at Walter Reed Army Hospital, was appointed the first Superintendent of Army dietitians in the Office of the Surgeon General. Under her leadership the Dietetic branch was organized and established as part of the Army Medical Service with full recognition of the hospital dietitian. For her outstanding professional achievements in this position, Major Gearin was awarded the Army Legion of Merit.

With the establishment of the Women's Medical Specialist Corps in 1947 as a component of the Regular Army, Major Gearin became the first chief of the Dietitian Section. The present Food Service organization in Army hospitals was initiated during her tour of duty.

Major Gearin is a graduate of Simmons College, Boston, Massachusetts, and of the Army Dietetic Internship, Walter Reed Army Hospital. Before her retirement she was Chief, Food Service Division, Valley Forge Army Hospital, Phoenixville, Pa. Major Gearin will make her home in Florida.

CIVILIAN DOCTORS NEEDED

The Army has a number of positions for qualified civilian doctors with salaries ranging from $7,465 to $11,395 annually. Applications may be made at the personnel office of any Army installation.

Navy

Surgeon General—Rear Adm. Bartholomew W. Hogan

Deputy Surgeon General—Rear Admiral Bruce E. Bradley

COMMANDING OFFICER, NNMC

Rear Admiral H. Lamont Pugh, former Surgeon General of the Navy, has been

designated as the new commanding officer of the National Naval Medical Center at Bethesda, Maryland, upon the retirement of Rear Admiral Stone.

ASSIGNMENT IN PERSONNEL DIVISION

Captain Robert L. Ware, MC, has been assigned as Head of the Medical Corps Branch of the Personnel Division. He relieved Captain Edwin B. Coyl, MC, who has become the Executive Officer, U. S. Naval Hospital, Portsmouth, Va.

HEADS NP BRANCH

Captain George N. Raines, MC, has been appointed as Head of the Neuropsychiatry Branch in the Bureau of Medicine and Surgery. Captain Raines came to this position from the U. S. Naval Hospital, Portsmouth, Va.

REPRESENTS NAVY AT MEETINGS

Captain Bennett F. Avery, MC, USN, Director of the Publications Division of the Bureau of Medicine and Surgery and Director of the Armed Forces Medical Publication Agency, represented the Navy Department at the meeting of the Interallied Committee of Reserve Medical Officers, held in Amsterdam, Netherlands, September 11-17. Regular and Reserve medical officers of the NATO nations participated in this 19th Study Session.

Lt. General S. Fadda, Medical Corps of the Italian Army, is President of the Committee.

LCDR Lloyd F. Miller, MC, Head of the Biological and Chemical Warfare Branch of the Special Weapons Defense Division of the Bureau of Medicine and Surgery, represented the Bureau as an official U. S. delegate to the 10th Tripartite Conference held at Ottawa, Canada, on September 12-23.

REPRESENT SCHOOL OF AVIATION MEDICINE

The Naval School of Aviation Medicine at the Naval Air Station, Pensacola, Florida, was represented by staff members at the convention of the American Psychology Association held in San Francisco, September 3-7.

Dr. W. B. Webb, Head of the Psychology Laboratory, presented a paper on "The Possibilities of Predicting Aircraft Accidents From Measures Taken on Pilots." Ensign Joseph DeRivera presented a paper, "The Most Efficient Method of Training the Eye to Track Moving Targets." Dr. J. R. Birkshire presented a paper on "Ways of Constructing Tests So As To Be Independent of Faking."

MEDICAL SERVICE CORPS DIVISION

On July 28, the Medical Service Corps Division of the Bureau of Medicine and Surgery was established, and the former Medical Service Corps Branch of the Personnel Division was concurrently disestablished.

Captain Willard C. Calkins assumed the duties of Director of the new division.

ASSISTS IN SMOG STUDY

Navy blimps were used during August and September in the study of smog over the Los Angeles area. Samples of the air were taken at various altitudes and analyzed at the Chaney Chemical Laboratories of Los Angeles. Tests were made for oxides of nitrogen, oxidants, carbon monoxide and for particulate matter, both organic and inorganic. In these tests the Navy is assisting the Air Pollution Foundation of Los Angeles.

RETIRED

Commander Linus J. Kirkhoff, DC USNR, recently retired after 35 years of naval and military service. A veteran of the Mexican Border in 1916, Commander Kirkhoff served as a Captain in the Field Artillery in World War I. Although considered over age for active duty during World War II, he volunteered for duty as a Chief Pharmacist's Mate. Later he was commissioned a Lieutenant, DC, U. S. Naval Reserve, while serving on active duty at Nouméa, New

Caledonia. Commander Kirkhoff was shortly thereafter promoted to a Lieutenant Commander. As a Reservist he has been extremely active in Naval Reserve Dental Company 12-1 in San Francisco, taking correspondence courses and training duty at frequent intervals.

Commander Kirkhoff's present address is 65 Buena Vista Avenue, East, San Francisco, California.

RETIRED

The following officers were retired as of August 1: Captains John P. Brady, MC, (920 Jackson St., Kalamazoo, Mich.) and Arthur W. Loy, MC, (Grandview, Tenn.); Commanders Henry T. Dean, MSC, (Shellman, Ga.) and Clarence J. Owen, MSC, (Las Animas, Colo.); Lieutenants Jack R. Brown, MSC, and George W. Perdue, DC.

CORRESPONDENCE COURSES

Officers and enlisted personnel of the Medical Service are encouraged to pursue correspondence courses to keep themselves at a high level of efficiency. Reserve officers can earn credit points for retirement, not to exceed 60 points per year. These credit points can be earned when not on active duty.

Applications for basic courses should be made to: U. S. Naval Correspondence Course Center, Building R. F., U. S. Naval Base, Brooklyn 1, New York.

Applications for professional courses should be made to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Maryland.

MEDICAL RESERVE PROGRAM OFFICER

Applications for full time active duty as a Medical Reserve Program Officer may be made by qualified reserve medical officers whose rank is commander or captain and who desire to serve on extended active duty for a period of two years or longer. In that capacity the officer will function as assistant to the District Medical Officer on the Medical Reserve Program. Full pay and allowances plus $100 per month and accrual of one retirement point for each day of active duty will be given. For further information concerning this duty reserve officers of the grade mentioned should write to the Chief, Bureau of Medicine and Surgery (Code 36), Department of the Navy, Washington 25, D.C.

EDUCATIONAL OPPORTUNITIES

When the general postgraduate course at the Naval Dental School convened at the National Naval Medical Center at Bethesda, Maryland, on September 1 there were 80 dental officers under instruction. This represented about 4% of the total strength of the Navy Dental Corps.

The opportunity for pursuing advanced instruction in the Navy has been estimated at about five times that for the dentists in civilian life. It can also be pointed out that this training is given with full pay and allowances and at no cost to the individual for tuition. In other words he is learning while he is earning, factors which can well be considered in these days of high living costs.

REGULAR NAVY APPOINTMENTS

Applications for appointment in the Medical and Dental Corps of the Regular Navy will be accepted from Naval Reserve officers serving in the grades of lieutenant (junior grade) and lieutenant who are under the ages of 34 and 37, respectively.

Also eligible for appointment in the grade of lieutenant commander are those who graduated from medical or dental school not more than 13 years prior to submission of their application, and are under 42 years of age.

Written professional examinations will not be required for appointment. The grade in which appointments will be offered will be determined by the applicant's length of professional experience, age, professional training, and attainments.

Air Force

Surgeon General—MAJ. GEN. DAN C. OGLE
Deputy Surg. Gen.—MAJ. GEN. W. H. POWELL, JR.

SPEAKS AT DEDICATION CEREMONIES

Major General Dan C. Ogle, Surgeon General of the Air Force, was principal speaker at the dedication ceremonies at the Elmendorf Air Force Base Hospital on September 4.

TO AMA WASHINGTON OFFICE

Brig. General William J. Kennard, USAF, Retired, has joined the Washington Office staff of the American Medical Association as Assistant Director. Brig. General Frank E. Wilson, MC, USAR, is the Director of that office.

General Kennard at the time of his retirement was surgeon of the Military Air Transport Service. He had served as chief of medical services for Supreme Headquarters Allied Powers in Europe and senior medical staff officer for the North Atlantic Treaty Organization.

PHYSICAL THERAPY CONSULTANT

Miss E. Jane Carlin has been appointed as National Physical Therapy Consultant to the Surgeon General of the Air Force. She is Assistant Director and Assistant Professor of the Division of Physical Therapy, University of Pennsylvania; Editor-in-Chief of the Physical Therapy Review; a Member of the Board of Directors and a Speaker of the House of Delegates of the American Physical Therapy Association.

During World War II Miss Carlin served in the Army as Physical Therapy Instructor and in hospitals in the Far East.

BECOMES CONSULTING PATHOLOGIST

Colonel Ralph M. Thompson, who retired recently, has associated himself with Dr. Richard E. Palmer of Alexandria, Virginia in the capacity of consulting pathologist.

Colonel Thompson was Deputy Director of the Armed Forces Institute of Pathology at the time of his retirement. He is a Diplomate of the American Board of Pathology with certification in Clinical Pathology and Pathologic Anatomy, a Fellow of the American College of Physicians, the College of American Pathologists, the American Society of Clinical Pathologists, and a Member of the American Association of Pathologists and Bacteriologists.

Colonel Thompson resides at 3111 Circle Hill Road, Beverly Hills, Alexandria, Virginia.

CHENEY AWARD WINNER

For his work on the effects of high speed flight on the human body Lt. Col. John P. Stapp, USAF, Chief of the Aero Medical Field Laboratory at Holloman Air Development Center, New Mexico, has been named the 1955 recipient of the Cheney Award. This award is presented yearly by the Chief of Staff, USAF, for an act of valor, extreme fortitude, or self-sacrifice in a humanitarian effort performed during the preceding year in connection with aviation.

It is well remembered that in December 1954, Col. Stapp rode a rocket sled 632 miles an hour and then braked to a stop on slightly more than a second to simulate the effects of bailout at supersonic speeds on aircrewmen.

COSMIC RADIATION EFFECTS

When man travels in outer space will he be affected by the cosmic rays? To answer some of the questions the Air Research and Development Command is engaged in a series of research projects.

Facts gathered from a series of balloon flights at Sault Saint Marie, Michigan, during 1954 have just been made known. Animals were sent aloft in these balloons which went to an altitude of 90,000 and 120,000 feet. Thus far the only effects noted were

that black rats incurred some damage to hair follicle pigment cells, causing the affected cells to produce white hair. Monkeys performed normally after their two flights; they have been followed for six months and have shown no effects from the experiments.

Public Health Service

Surgeon General—LEONARD A. SCHEELE, M.D.
Deputy Surg. Gen.—W. PALMER DEERING, M.D.

APPOINTMENT

Dr. Alonzo F. Brand has been appointed medical officer in charge of the Indian Health Area Office in Oklahoma City, Oklahoma. On July 1 the Public Health Service was made responsible for the medical care of the Indians.

Dr. Brand's office will administer the medical affairs of the Indians in the states of Oklahoma, Kansas, Florida, Mississippi, and North Carolina. There are about 67,500 Indians living on reservations in those states.

ASSIGNMENT TO ALBUQUERQUE OFFICE

Dr. Henry W. Kassel has been appointed medical officer in charge of the Indian Health Area Office in Albuquerque, New Mexico. He will be responsible for the medical care and public health services to more than 101,000 Indians on reservations located in Arizona, Colorado, New Mexico, and Utah.

Dr. Kassel holds the grade of medical director, which is the equivalent of the Army rank of colonel.

Veterans Administration

Chief Medical Director—WILLIAM S. MIDDLETON, M.D.
Deputy Chief Med. Dir.—R. A. WOLFORD, M.D.

PSYCHIATRY DIVISION HEAD

Dr. Stewart T. Ginsberg, who was manager of the new VA neuropsychiatric hospital at Pittsburgh, was transferred to the Central office in Washington to head the Psychiatry Division of the Psychiatry and Neurology Service, of which Dr. Jesse F. Casey is director.

Dr. Ginsberg, received his medical degree from the University of Minnesota in 1932, and joined the Veterans Administration in 1936. He was with the Army Medical Corps for two years during World War II, and at the time of his separation held the rank of lieutenant colonel.

ASSIGNMENTS

Dr. William K. Freeman, has been transferred from the position of manager of the VA hospital at Gulfport, Miss., to the same position at the VA hospital in Downey, Ill. He succeeds Dr. Lee G. Sewall who was recently transferred to the VA hospital at Pittsburgh, Pa.

George R. Hiskey has been appointed manager of the VA hospital in Cleveland, Ohio. During World War II Mr. Hiskey served as a Navy lieutenant commander. He joined the Veterans Administration in 1946.

John C. Phillips has been appointed as manager of the VA center at Dayton, Ohio. Prior to this assignment he was manager of the VA hospital at Cleveland, Ohio.

Dr. Oliver W. Greer has been appointed manager of the VA hospital at Lake City, Fla. He succeeds Dr. Oma E. Herndon, who was transferred to the Regional Office in Atlanta, Ga. Dr. Greer served in the grade of colonel in the Army Medical Corps in World War II.

VETERAN POPULATION

The estimated veteran population in civil life at the end of July was 21,921,000 as against 21,011,000 in July of 1954, and 21,878,000 at the end of June 1955.

The average daily patient load in VA hospitals was 106,658 and in non-VA hospitals 3,628. Visitors for outpatient medical care for the month of June amounted to 189,331.

NEW HEART TEST

Using radioisotopes doctors at the Bronx VA hospital have developed a new technique for measuring the pumping efficiency and status of heart action. It is said that this can be done speedily and accurately, and replaces the less accurate and slower method of using dye substances. In fact ten patients per hour can be examined by this new method.

A small amount of radioactive substance is injected into the blood stream of the patient, and by means of counters, amplifiers, and an oscilloscope screen a recording is made when the blood from an artery is examined. A graph of heart action can be plotted from the strip of film made.

Miscellaneous

AVIATION MEDICINE

The *National Geographic Magazine* for August carried a very interesting and instructive article, *Aviation Medicine on the Threshold of Space*, which it is believed will capture the interest and imagination of many persons. The article by Allan C. Fisher, Jr., of the National Geographic Staff, is illustrated by pictures in both color and black and white.

SOCIAL SECURITY

On the occasion of the Twentieth Anniversary of the Social Security Act recently, Marion B. Folsom, Secretary of the Health, Education, and Welfare Department stated that 14 million persons are receiving money payments under programs authorized by the Act. He pledged a continuing study of the social security system. The Secretary stated, "Social Security cannot remain static."

IMMUNIZATION INFORMATION BOOKLET

A supplement to the booklet *Immunization Information for International Travel* is now available for those persons having the 1954 edition of the booklet by writing to the U. S. Public Health Service, Division of Foreign Quarantine, Washington 25, D.C. There is no charge for the supplement.

The booklet, including the new supplement, may be purchased for 20¢ from the Superintendent of Documents, Government Printing Office, Washington 25, D.C. A 25% discount is allowed on orders of 100 copies or more delivered to the same address.

X-RAY FILM CASSETTES

Standard dimensions for medical x-ray film cassettes have been adopted by the American Standards Association, Inc., 70 East 45th St., New York 17, N.Y. The Department of Defense and twenty-three members of industry participated in the standardization which was recently approved.

MEDICAL JOURNAL FOR RESIDENTS

Resident Physician is the name of a new medical journal which made its bow in September. The editorial content of this journal will consist of original articles geared especially to residents' education, economic, and personal problems within and outside the hospital.

Perrin H. Long, M.D., is Editor-in-Chief, with office at 676 Northern Blvd., Great Neck, New York.

ALBERT SCHWEITZER FUND

Many of us know of the work of Albert Schweitzer and his hospital at Lambarene, Africa, but few of us know that an office has been established in the United States for the purpose of accepting contributions for that hospital. The Albert Schweitzer Hospital Fund headquarters has been established at 34 East 51st St., New York 22, N.Y. and those who wish to make contributions to the hospital of this Nobel Peace Prize winner can send them to that office.

STUDENT AMA ADDRESS

The new address for the Student American Medical Association is: 510 N. Dearborn St., Chicago 10, Ill.

AWARD WINNER

The National Association of Sanitarians at their 19th Annual Educational Conference in Boston recently awarded the first General Fred A. Safay Memorial Scholarship for advanced study of environmental sanitation to Mr. Nicholas Pohlit of Colorado. The award consisted of $1,500. The Association offices are at Room 1025, 250 Park Ave., New York 17, N.Y.

VAN METER PRIZE AWARD

The American Goiter Association offers the Van Meter Prize Award of $300 and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. Competing essays, not over 3,000 words in length, may cover either clinical or research investigations. Manuscripts should be submitted to the Secretary, Dr. John C. McClintock, 149½ Washington Ave., Albany, New York, by January 1, 1956.

MEDICAL MEETING

The annual convention of the American College of Gastroenterology will be held at the Shoreland in Chicago on October 24, 25, and 26. Following this meeting on October 27-29, there will be the annual course in Postgraduate Gastroenterology.

PHYSICAL THERAPY CONGRESS

The Second Congress of the World Confederation for Physical Therapy will be held at the Hotel Statler, New York City, June 17-23, 1956. The theme for the Congress is "Health, A Strong Force for World Understanding—The Role of the Physical Therapist."

Further information may be obtained from Secretary at 1790 Broadway, New York 19, N.Y.

OPHTHALMOLOGY CONGRESS MEETING

The Fifth Pan American Congress of Ophthalmology will meet in Santiago, Chile, January 9-14, 1956. The program will be especially devoted to the subject of blindness. Persons interested in this meeting should address: Dr. Daniel Snydacker, 109 North Wabash Avenue, Chicago 2, Ill.

Honor Roll

Since the publication of our last list, the following sponsored one or more applicants for membership in the Association:

Col. Bernard Aabel, MSC, U.S.A.
Lt. Col. E. F. Ackerman, MSC, U.S.A.
W. Compere Basom, M.D.
Lt. Col. Edmund G. Beacham, MC, Md. NG.
Major Robert Buchanan, MC, U.S.A.
Lt. Cdr. Jervace Crouse, NC, U.S.N.
Capt. Benjamin G. Feen, MC, U.S.N.
Col. Bryan C. T. Fenton, MC, U.S.A.
Phar. Dir. Thomas A. Foster, USPHS
Col. Nolton E. Fowler, USAF (DC)
Major John H. Harrison, VC, U.S.A.
Major Gen. Leonard D. Heaton, MC, U.S.A.
Col. R. E. Hewett, MC, U.S.A.
Col. Francis P. Kintz, MC, U.S.A.
Capt. L. P. Kirkpatrick, MC, U.S.N.
Capt. Richard H. Klitch, MSC, U.S.A.
Lt. Col. Robert S. Lockwood, MC, U.S.A.
Capt. Julian Love, MC, U.S.N.
Lt. Col. Agnes A. Maley, ANC
Lt. Col. I. H. Marshall, MC, U.S.A.
Col. Paul H. Milton, MC, U.S.A.R.
R. F. Mulligan, M.D.
Capt. L. T. O'Desky, MC, U.S.A.
Col. Roger G. Prentiss, Jr. MC, U.S.A.
Col. Louis F. Saylor, MC, U.S.A.
Capt. Wm. M. Silliphant, MC, U.S.N.
Brig. Gen. H. H. Twitchell, USAF (MC)

THE WHITE HOUSE
WASHINGTON

Denver, Colorado
August 25, 1955

Dear General Martin:

I am delighted to send my greetings to those attending the Sixty-second Annual Meeting of the Association of Military Surgeons of the United States.

The military surgeon and his medical associates deserve fully the nation's recognition of their unselfish devotion to the betterment of the health of mankind. Their role in the advancement of medical science, both civilian and military, should be known and admired world-wide.

Please extend to all of them, and to the Association's honored foreign guests, a cordial welcome and my best wishes for success in the forthcoming convention.

Sincerely,

Dwight D. Eisenhower

Major General Joseph I. Martin
President
The Association of Military Surgeons
of the United States
1726 Eye Street, N. W.
Washington 6, D. C.

ASSOCIATION OF MILITARY SURGEONS OF U.S. ANNUAL CONVENTION, HOTEL STATLER WASHINGTON, D.C.—NOV. 7, 8, AND 9, 1955

Registration

SUNDAY, NOVEMBER 6, 1-5 P.M.
MONDAY, NOVEMBER 7, 8:00 A.M.
Reserve Officers Register for Credit Points.

MONDAY MORNING, NOVEMBER 7

Presidential Ballroom
9:30 A.M.

Presiding: MAJOR GENERAL JOSEPH I. MARTIN, MC, USA, President

Association President's Address
Major General Joseph I. Martin, MC, USA, Special Assistant to The Surgeon General, Department of the Army

Welcoming Remarks
Frank B. Berry, M.D., Assistant Secretary of Defense (Health and Medical)

Ten Years of Atomic Medicine
Shields Warren, M.D., Advisor to the Atomic Energy Commission, Professor of

Medicine, Harvard Medical School) Director, New England Deaconess Hospital, Boston 15, Mass.

Military Hospitals
Major General Silas B. Hays, MC, USA, The Surgeon General, Department of the Army

Medical Personnel Problems in the Military Services
Rear Admiral Bartholomew W. Hogan, MC, USN, The Surgeon General, Department of the Navy

Dependent Care in the Military Services
Major General Dan C. Ogle, USAF (MC), The Surgeon General, Department of the Air Force

Preventive Medicine in an Atomic Age
Leonard A. Scheele, M.D., The Surgeon General, Public Health Service, Department of Health, Education, and Welfare

Medical Aspects of Radiation Energy as Applied to the Hematopoietic System
William S. Middleton, M.D., Chief Medical Director, Veterans Administration

The FCDA Medical Stockpile
John M. Whitney, M.D., Medical Director Public Health Service, Director, Health Office, Federal Civil Defense Administration

Medicinal Supplies for Mass Casualties from a Pharmaceutical Producer's Viewpoint
Raymond M. Rice, M.D., Executive Director, Medical Research, The Lilly Research Laboratories, Eli Lilly and Company, Indianapolis 6, Indiana

Luncheon

Visit and register at commercial and scientific exhibits

MONDAY AFTERNOON, NOVEMBER 7
2:30 P.M.—*Presidential Ballroom.*

Presiding: BRIGADIER GENERAL HAROLD H. TWITCHELL, USAF (MC) Surgeon, Continental Air Command, Mitchell Air Force Base, New York

Theme: Medical Effects of Nuclear Warfare

Introduction to Problems
Brigadier General James P. Cooney, MC, USA, Deputy Surgeon General, Department of the Army

Phenomena Associated with Nuclear Detonations
Howard L. Andrews, Ph.D., Scientist Director, Public Health Service, Head, General Radiobiological Section, Radiation Branch National Cancer Institute, National Institutes of Health, Bethesda 14, Maryland

Mechanical and Secondary Missile Injuries
Commander John A. O'Donoghue, MC, USN, Head, Atomic Defense Branch, Special Weapons Defense Division, Bureau of Medicine and Surgery, Department of the Navy

Thermal Injuries
Herman Pearse, M.D., AEC Project, University of Rochester, Rochester 20, N.Y.

Radiation Injuries Resulting from Nuclear Explosion and Fall-out
George M. Lyon, M.D., Assistant Chief Medical Director for Research, Department of Medicine and Surgery, Veterans Administration

Eye Injuries in Nuclear Warfare
Colonel Victor A. Byrnes, USAF (MC), Director of Professional Services, Office of The Surgeon General, Department of the Air Force

Summary and Discussion
Brigadier General James P. Cooney, MC, USA, Deputy Surgeon General, Department of the Army

TUESDAY MORNING, NOVEMBER 8
8:30 A.M.—*Presidential Ballroom*

Presiding: JOHN B. HOZIER, M.D., Medical Director, Chief, Health Emergency Planning, Office of The Surgeon General, Public Health Service

Theme: Principles of Care of Mass Casualties

Introduction to Principles and Objectives
John B. Hozier, M.D.

Protective Measures in Nuclear Warfare
Lieutenant Colonel S. E. Lifton, USAF (MC), Special Weapons Defense Officer,

Preventive Medicine Division, Office of The Surgeon General, Department of the Air Force

Casualty Estimates in Nuclear Warfare
Lieutenant Colonel Arthur Steer, MC, USA, Chief, Department of Experimental Biology, Army Medical Service Graduate School, Washington 12, D.C.

Initial Aid and Rescue
John M. Whitney, M.D., Medical Director, Public Health Service, Director, Health Office, Federal Civil Defense Administration

Sorting and Classification of Casualties
Lieutenant Colonel James B. Hartgering, MC, USA, Director, Physiology and Pharmacology Division, Army Medical Service Graduate School, Washington 12, D.C.

Emergency Medical Care
Robert Leslie Smith, M.D., Medical Director, Public Health Service, Deputy Director, Health Office, Federal Civil Defense Administration

Treatment of Mass Mechanical Injuries
Colonel Joseph R. Shaeffer, MC, USA, Chief Surgical Consultant, Office of The Surgeon General, Department of the Army

Treatment of Mass Thermal Injuries
Captain Donald W. Miller, MC, USN, Chief of Surgery, U. S. Naval Hospital, Newport, Rhode Island

Convocation in honor of distinguished foreign visitors

International Luncheon (Federal Room)

TUESDAY AFTERNOON, NOVEMBER 8
1:30 P.M.—*Presidential Ballroom*

Presiding: REAR ADMIRAL IRWIN L. V. NORMAN, MC, USN, Assistant Chief for Personnel and Professional Operations, Bureau of Medicine and Surgery, Department of the Navy

Theme: Principles of Care of Mass Casualties

Introduction to Problems
Rear Admiral Irwin L. V. Norman, MC, USN

Treatment of Radiation Injuries
Commander Eugene P. Cronkite, MC, USNR, Head, Pathology Division, Brookhaven National Laboratories, Upton, Long Island, New York

Management of Mass Psychiatric Casualties
Colonel Albert J. Glass, MC, USA, Deputy Director, Neuropsychiatry Division, Army Medical Service Graduate School, Washington 12, D.C.

Cost of Delays in Treatment
John M. Howard, M.D., Chairman, Department of Surgery, Emory University School of Medicine, Emory University, Georgia

Military Medical Aspects of Antibiotics and Biologicals for Mass Casualties
Colonel Herbert W. Coone, USAF (MC), Chief, Medical Service, Director of Professional Services, USAF Hospital, Wright-Patterson Air Force Base, Ohio

Blood and Plasma Volume Expanders for Mass Casualties
Captain Lloyd R. Newhouser, MC, USN, Ret., Director, John Elliott Blood Bank of Dade County, Miami 52, Florida

Anesthesia and Sedation for Mass Casualties
Colonel Harvey C. Slocum, MC, USA, Chief, Anesthesia and Operative Service, Walter Reed Army Hospital, Washington 12, D.C.

Summary
Major General I. S. Ravdin, MC, USAR, John Rhea Barton Professor of Surgery and Director of Harrison Department of Surgical Research, University of Pennsylvania School of Medicine, Philadelphia 4, Pennsylvania

Discussion
Led by Rear Admiral Richard A. Kern, MC, USNR, Ret., Professor and Head of Department of Medicine, Temple University School of Medicine, Philadelphia, Pennsylvania

WEDNESDAY MORNING, NOVEMBER 9
8:30 A.M.—*Presidential Room*

Presiding: REAR ADMIRAL THOMAS F. COOPER, MC, USN, Assistant Chief for

Planning and Logistics, Bureau of Medicine and Surgery, Department of the Navy

Theme: Organization for the Management of Mass Casualties

Introduction to Problems
Rear Admiral Thomas F. Cooper, MC, USN

Public Health and Sanitation Problems in Nuclear Warfare
Robert Leslie Smith, M.D., Medical Director, Public Health Service, Deputy Director, Health Office, Federal Civil Defense Administration
and
Albert H. Stephenson, Sanitary Engineer Director, Public Health Service, Director, Sanitation Division, Health Office, Federal Civil Defense Administration

Welfare Problems in Nuclear Warfare
Honorable Charles I. Schottland, Commissioner of Social Security, Department of Health, Education, and Welfare

Role of Nurses
Cecilia H. Hauge, R.N., Director, Nursing Service, Department of Medicine and Surgery, Veterans Administration

Role of Medical Service Corps Officers in the Management of Mass Casualties
Commander Kenneth L. Knight, MSC, USN, Division of Preventive Medicine, Bureau of Medicine and Surgery, Department of the Navy

The Role of Dietitians, Physical and Occupational Therapists in the Management of Mass Casualties
Colonel Harriet S. Lee, WMSC, USA, Chief, Women's Medical Specialist Corps, Office of The Surgeon General, Department of the Army
Role of Enlisted and Technical Assistants
Major John C. Delahunt, USAF (MSC), Directorate of Plans and Hospitalization, Office of The Surgeon General, Department of the Air Force

Role of the Veterinary Officer in the Management of Mass Casualties
Lieutenant Colonel Leslie C. Murphy, VC, USA, Deputy Director, Veterinary Division, Army Medical Service Graduate School, Washington 12, D.C.

The Role of the Dental Officer
Captain John V. Niiranen, DC, USN, Chief, Prosthodontics Division, U. S. Naval Dental School, National Naval Medical Center, Bethesda 14, Maryland

Role of Medical Officers
Colonel Karl H. Houghton, USAF (MC), Technical Assistant, Human Factors, Air Force Special Weapons Center, Kirtland Air Force Base, New Mexico

Summary and Discussion
Brigadier General Harold W. Glattly, MC, USA, Surgeon, First Army, New York, N.Y.

Business Meeting

WEDNESDAY AFTERNOON, NOVEMBER 9
1:30 P.M.—*Presidential Ballroom*

Presiding: PAUL M. IRELAND, M.D., Director, Surgical Service, Department of Medicine and Surgery, Veterans Administration

Theme: Organization for the Management of Mass Casualties

Introduction to Problems
Paul M. Ireland, M.D.

Training for the Management of Mass Casualties
Colonel Hallman E. Sanders, USAF (MC), 3882d School Group, Gunter Air Force Base, Alabama

Organization for the Sorting of Casualties
Lieutenant Colonel Joseph D. Goldstein, MC, USA, Assistant Chief, Department of Atomic Casualties Studies, Army Medical Service Graduate School, Washington 12, D.C.

Organization of Field and Fixed Hospitals for the Management of Mass Casualties
Colonel William S. Moore, MC, USA, Chief, Hospitalization and Operations Branch, Medical Plans and Operations Division, Office of The Surgeon General,

Department of the Army
Organization of "Medical Holding Units"
Colonel Thomas N. Page, MC, USA, Chief, Medical Plans and Operations Division, Office of The Surgeon General, Department of the Army
Summary
Colonel Robert L. Hullinghorst, MC, USA, Deputy Commandant, Army Medical Service Graduate School, Washington 12, D.C.
Discussion
Led by Brigadier General Harold G. Scheie, MC, USAR, Commanding, 31st Hospital Center, Schuylkill Arsenal, 2620 Grays Ferry Avenue, Philadelphia 46, Pennsylvania
Adjourn

PANEL MEETINGS

WEDNESDAY, NOVEMBER 9

Dental Section

South American Room
8:30 A.M.—NOON

Presiding: REAR ADMIRAL R. W. MALONE, DC, USN, Assistant Chief for Dentistry and Chief, Dental Division, Bureau of Medicine and Surgery, Department of the Navy

The Preparation of Army Dental Corps Officers for Their Mission in Atomic Warfare
Colonel Robert B. Shira, DC, USA, Chief, Oral Surgery Section, Walter Reed Army Hospital, Chairman, Oral Surgery Section, Dental Division, Army Medical Service Graduate School, Washington 12, D.C.
The Proposed Role of the Air Force Dental Officer in a National Emergency
Colonel Charles S. O'Grady, USAF (DC), Chief, Professional Standards Division, Dental Services, Office of The Surgeon General, Department of the Air Force
The Proposed Role of the Veterans Administration Dental Officer in a National Emergency
Edwin G. Kerans, D.D.S., Chief, Dental Service, Veterans Administration Hospital, Washington, D.C.
The Training of Dentists for Mass Casualty Care
Russell W. Bunting, D.D.S., Dental Consultant, Health Office, Federal Civil Defense Administration
The Proposed Role of the Naval Dental Officer in a National Emergency
Captain John V. Niiranen, DC, USN, Chief, Prosthodontics Division, U. S. Naval Dental School, National Naval Medical Center, Bethesda 14, Maryland
The Proposed Role of the Public Health Service Dental Officer in a National Emergency
Norman F. Gerrie, D.D.S., Dental Director, Acting Chief Dental Officer, Public Health Service
Discussion:
Led by Captain C. W. Schantz, DC, USN, Commanding Officer, U. S. Naval Dental School, National Naval Medical Center, Bethesda 14, Maryland

Sustaining Membership Section

Federal Room
9:00-11:15 A.M.

Presiding: C. W. SHILLING, M.D., Special Assistant to the Director, Division of Biology and Medicine, U. S. Atomic Energy Commission

Panel Discussion:
Federal Procurement of Pharmaceuticals and Medical Equipment
Moderator:
Captain A. W. Eyer, MC, USN, Chief, Armed Services Medical Procurement Agency, 84 Sands Street, Brooklyn 1, New York
Panel Discussants:
Captain J. T. Mudler, DC, USN, Chair-

man, Armed Services Medical Matériel Standardization Committee, Washington 25, D.C.

Mr. Reid Hovey, Chief, Supply Branch, Public Health Service

Mr. Glenn C. Parmelee, Director, Supply Service, Department of Medicine and Surgery, Veterans Administration

Panel Discussion:

Clinical Testing and Joint Industry-Federal Research

Moderator:

L. Eugene Daily, M.D., Executive Vice President, Eaton Laboratories, Division of Norwich Pharmacal Company, 17 Eaton Avenue, Norwich, New York

Panel Discussants:

Directors of Medical Research Divisons of Federal Agencies

General Discussion:

Cooperation between Industry and Federal Medical Services

Moderator:

Mr. Howard B. Fonda, Senior Vice President, Burroughs Wellcome & Company, Inc., 1 Scarsdale Road, Tuckahoe 7, New York

Sanitary Engineering Section

Joint Meeting with the Conference of Federal Sanitary Engineers
South American Room

1:30-5:00 P.M.

Presiding: M. D. HOLLIS, Assistant Surgeon General, Chief Sanitary Engineer, Public Health Service

National Specialty Board Certification in Sanitary Engineering

Lieutenant Colonel Alvin F. Meyers, Jr., USAF (MSC), 1701 South 78th Street, Omaha, Nebraska

Publications of A.S.C.E. Division of Sanitary Engineering and their Potential for the Sanitary Engineering Profession

Paul W. Reed, Associate Editor, Sanitary Engineering Division, ASCE Newsletter, c/o Division of Sanitary Engineering Services, Public Health Service, Washington 25, D.C.

Relationships of Professional Registration of Sanitary Engineers and the Federal Services

Paul H. Robins, Executive Secretary, National Society of Professional Engineers, 1121—15th Street, N. W., Washington, D.C.

Panel: Meeting Staffing Needs in New Fields:

Radiological Health Engineering

E. C. Anderson, Assistant Chief, Radiological Health Program, Division of Sanitary Engineering Services, Public Health Service, Washington 25, D.C.

Noise Abatement

Major Ralph F. Thompson, USAF (MSC), Preventive Medicine Division, Office of The Surgeon General, Department of the Air Force

Removal of Strontium-90 from Water

Captain Thomas R. Ostrom, MSC, USA, Sanitary Engineering Division, Army Environmental Health Laboratory, Army Chemical Center, Maryland

Veterinary Section

Federal Room
2:30-4:45 P.M.

Presiding: BRIGADIER GENERAL ELMER W. YOUNG, VC, USA, Chief, Veterinary Division, Office of The Surgeon General, Department of the Army

Role of Veterinarians in the Management of Mass Casualties

Lieutenant Colonel Leslie C. Murphy, VC, USA, Deputy Director, Veterinary Division, Army Medical Service Graduate School, Washington 12, D.C.

An Informed Profession is Vital to the Nation's Health

James Lieberman, D.V.M., Veterinary Training Consultant, Public Health Service, Atlanta 23, Georgia

Recognition of Rinderpest and African Swine Fever

Lieutenant Colonel Fred D. Maurer, VC, USA, Armed Forces Institute of Pathology, Walter Reed Army Medical Center, Washington 12, D.C.

HONORS NIGHT DINNER—PRESIDENTIAL ROOM—7:30 P.M.—NOV. 9

THE HONORABLE VAL PETERSON, FEDERAL CIVIL DEFENSE ADMINISTRATOR, SPEAKER

Presentation of Awards

LADIES EVENTS

MONDAY, NOV. 7

Trip to Armed Forces Institute of Pathology

TUESDAY, NOV. 8

Luncheon and Fashion Show
Forest Glen Annex
Walter Reed Army Medical Center

WEDNESDAY, NOV. 9

Morning

Trip to Federal Bureau of Investigation
Trip to Washington Cathedral

Afternoon

Cinerama Holiday—Warner Theater

SCIENTIFIC EXHIBITS

DEPARTMENT OF THE ARMY

The Medical Management of Mass Casualties.

This exhibit illustrates injuries due to the A-bomb, together with other pertinent data relating to anticipated medical problems associated with the use of nuclear weapons.

DEPARTMENT OF THE NAVY

Experimental Therapy of Bone Marrow Aplasia Induced by Ionizing Radiation.

This exhibit graphically represents the facilities at the Naval Medical Research Institute for whole body gamma-irradiation of dogs by a cobalt source; the pathologic and clinical features of the acute radiation syndrome, with particular emphasis on bone marrow aplasia, pancytopenia, and the sequelae of infection and hemorrhage; the experimental therapy of the acute bone marrow failure by platelet and leukocyte transfusion; and the possibility of the existence of humoral mechanism capable of accelerating bone marrow regeneration.

DEPARTMENT OF THE AIR FORCE

Training of Medical Service Technicians in Their Independent Duty.

This exhibit depicts the training of Medical Service technicians at the Gunter Branch, USAF School of Aviation Medicine in their independent duties in the field.

PUBLIC HEALTH SERVICE

Vaginal Cytology.

This exhibit emphasizes the importance of cell-examination tests as a case-finding tool for uterine cancer. Results of a mass screening project in Memphis-Shelby County, Tennessee, are reported.

INDIAN HEALTH SERVICE

The Expanded Program of Indian Health.

A graphic presentation of the Indian Health problem and public health measures being taken to meet it.

VETERANS ADMINISTRATION

Executive Housekeeping—A Staff Function.

This exhibit describes the role of housekeeping as part of the administrative responsibility of hospital management with particular reference to work performance, standards and staffing.

ARMED FORCES INSTITUTE OF PATHOLOGY

Training in the Care of the Ten Most Common Traumatic Injuries.

This exhibit illustrates the use of moulages as training aids in the Army Medical Service first aid training program.

MILITARY MEDICINE

Military Medicine Around the World.

Depicts the exchange of medical journals between MILITARY MEDICINE and other medical journals throughout the world.

FILM PROGRAM

New York Room

MONDAY, NOVEMBER 7

10:00 A.M.

THE MANAGEMENT OF HYPERTENSION—(Wyeth Laboratories)
Black and White—sound—1 hour.

A kinescopic recording of the television symposium on hypertension sponsored by the American College of Physicians September 1954.

11:05 A.M.

RESECTION OF ARTERIOSCLEROTIC ANEURYSMS OF THE ABDOMINAL AORTA AND REPLACEMENT BY HOMOGRAFT—(Davis and Geck, Inc.)
Color—sound—26 minutes.

11:35 A.M.

THE HOSPITAL WARD TEAM—(Department of the Army)
Black and White—sound—23 minutes.

1:30 P.M.

BRONCHO-PULMONARY LESIONS—(E. Fougera & Co., Inc.)
Depicts the four popular methods of instilling lipiodol into the broncho-pulmonary apparatus.
Color—sound—30 minutes.

2:05 P.M.

THE ATOM AND THE DOCTOR—(Atomic Energy Commission)
Depicts the use of radioisotopes in medicine
Black and White—sound—13 minutes.

2:20 P.M.

THE USE OF GENTRAN (6% dextran in saline) AS A PLASMA VOLUME EXPANDER—(Baxter Laboratories, Inc.)
Color—sound—16 minutes.

2:40 P.M.

OTOSCOPY IN THE INFLAMMATIONS—(Doho Chemical Corp.)
Color—sound—30 minutes.

3:15 P.M.

THE HUMAN BLOOD FLUKE—(Burroughs Wellcome & Co.)
Illustrates the life cycle of *Schistosoma mansoni.*
Color—sound—30 minutes.

TUESDAY, NOVEMBER 8

9:30 A.M.

NEPHROSIS IN CHILDREN—(Pfizer Laboratories)
Color—sound—18 minutes.

9:55 A.M.

THE OPEN METHOD OF BURN THERAPY—(Eaton Laboratories, Inc.)
Color—sound—20 minutes.

10:20 A.M.

PREVENTIVE PSYCHIATRY IN THE NAVY—THE ROLE OF THE JUNIOR OFFICER—(Department of the Navy)
Black and White—sound—2 parts—46 minutes.

11:15 A.M.

U. S. Air Force Film to be be announced.

1:30 P.M.

BRONCHOPULMONARY SEGMENTS—(Pfizer Laboratories)
Depicts the relationship of bronchopulmonary segments to bronchoscopy.
Color—sound—31 minutes.

2:05 P.M.

DIAMOX IN THE TREATMENT OF CONGESTIVE HEART FAILURE, GLAUCOMA, AND EPILEPSY.—(Lederle Laboratories)
Color—sound—15 minutes.

2:25 P.M.

DELIVERY OF TRIPLETS WITH LOW SPINAL ANAESTHESIA — (Ciba Pharmaceutical Products, Inc.)
Personnel of the Air Force Hospital at Bolling Field participated in the making of this film.
Color—sound—20 minutes.

2:50 P.M.

GOUT AND GOUTY ARTHRITIS—(Sharp and Dohme)
Color—sound—24 minutes.

3:20 P.M.

ALLERGY—(Nepera Chemical Co.)
Immunology, diagnosis and treatment.
Color—sound—45 minutes.

WEDNESDAY, NOVEMBER 9

9:30 A.M.

DEBRIDEMENT—(Department of the Army)
Color—sound—39 minutes.

10:15 A.M.

INITIAL SURGERY OF ABDOMINAL WOUNDS—(Department of the Army)
Color—sound—37 minutes.

10:55 A.M.

RESUSCITATIVE CARE OF THE SEVERELY WOUNDED—(Department of the Army)
Color—sound—32 minutes.
(This film and the two preceding films are preliminary prints not yet cleared for distribution pending final review.)

11:30 A.M.

FRACTURES ABOUT THE WRIST AND HAND—(Veterans Administration)
Color—sound—30 minutes.

1:30 P.M.

UTERINE CANCER: THE PROBLEM OF EARLY DIAGNOSIS—(Public Health Service)
Color—sound—21 minutes.

1:55 P.M.

REGIONAL ANALGESIA—(Winthrop-Stearns, Inc.)
Color—sound—30 minutes.

2:30 P.M.

TREATMENT OF SKIN DEFECTS BY SURGICAL ABRASION—(Orthopedic Frame Co.)
Color—silent—15 minutes.

BOOK REVIEWS

ABDOMINAL OPERATIONS. 3rd ed. By Rodney Maingot, F.R.C.S. (Eng.). Surgeon to Royal Free Hospital, London. 1568 pages, illustrated. Appleton-Century-Crofts, Inc., New York. 1955. Price $24.50.

This book is a very comprehensive and informative work on nearly all phases of abdominal surgery. Surgery of the adrenal glands, urinary tract and female reproductive organs is not covered. Some of the newer developments concerning the surgery of abdominal aortic aneurysms are not covered. However, the surgery of the rest of the abdominal cavity and abdominal wall is very thoroughly dealt with and the main historical development is given. The bibliography (given in parentheses in the text) is extremely useful as the reader can immediately see the source and the availability of the original literature or experimental work that forms the basis for that particular part of the text. By so doing a chronological development of the various operative procedures is fixed in the reader's mind. Although the book is a very large and detailed work it is quite up to date. There are 24 collaborators of which 7 are American surgeons, in addition there are contributions by 6 other American surgeons so that the book represents an authoritative opinion of both the American and British points of view. This book, well written and quite readable is particularly suited for anyone doing abdominal surgery.

RAY N. BROWN, M.D., F.A.C.S.

DISEASES TRANSMITTED FROM ANIMALS TO MAN. 4th ed. By Thomas G. Hull, Ph.D. 717 Pages, illustrated. Charles C Thomas, Springfield, Ill. 1955. Price $12.00.

This recent edition has been improved considerably by grouping related subjects and adding seven new chapters. Twenty-four authors have contributed to this excellent reference and textbook. The latest available information on the zoonoses is contained in this work.

The book includes the etiology, pathology, incidence, control and transmissibility of the zoonoses. The material is presented in a manner that is easy and interesting to read, yet detailed.

The text is well illustrated with graphs, charts and photographs. The photographs of gross and microscopic pathology are excellent. The photographs showing clinical symptoms should be enhanced.

The book is well printed on a good grade of paper. Numerous references are listed by each contributing author.

This excellent work should be a "must" for medical students, physicians, and public health officials.

COL. WM. E. JENNINGS, VC, USA

BICKHAM-CALLANDER: SURGERY OF THE ALIMENTARY TRACT. By Richard T. Shackelford, M.D., Assistant Professor of Surgery, Johns Hopkins University School of Medicine, Baltimore. Three volumes. 2575 pages. W. B. Saunders Co., Phila. and London. 1955. Price $60.00.

The names Bickham and Callander have been great names in surgery for a generation or more. The three volumes here reviewed will probably make the name Shackelford as much a household word in surgery as were those of his predecessors.

Since 1924 Bickham's six (and later seven) volume work on "Operative Surgery" has been a standard reference work in all medical libraries and on the shelves of most surgeons in this country. When Dr. Bickham died, his publishers asked Dr. C. Latimer Callander, equally well known for his "Surgical Anatomy," to revise the work of Dr. Bickham. Unfortunately death (1947) overtook Dr. Callander before he could complete his task, although he had been working on it for nine years.

Dr. Shackelford was then asked to take over the job; he began it in 1948. Bickham's original work described almost every conceivable operation that had ever been done by any surgeon anywhere. Shackelford decided to limit his work to the surgery of the alimentary tract, to describe only those operations which had proven useful, and to give a critical estimate of the procedures described. This, in the present reviewer's opin-

ion, greatly enhances the value of the work. While the original work included a wealth of operative techniques, there was no hint as to which operation for any particular condition had been proven to be the best. Likewise, there was no hint that some of the procedures described were entirely worthless. These defects have been eliminated in the present three volumes.

The author has presented all of the best operative techniques with amazing clarity. His language is lucid and his illustrations are excellent. But he has done more than this. He has presented also the pertinent anatomy, physiology, and pathology. He has presented the clinical picture with the necessary diagnostic tests and aids. After giving the operative procedure, he discusses the possible complications and the postoperative care.

Besides all this, the author has made his three volumes differ from the original Bickham volumes in that he has offered an evaluation of each procedure described. He states in his preface that these comments on evaluation are based on his own experience and on reports from the literature. He has indicated whether a given procedure seems to be the one of choice. In those procedures which he does not consider to measure up to the best standards, he has pointed out in what respects they are lacking. The indications and contra-indications for the various procedures are set forth.

In short, these three volumes are not simply an "Operative Surgery," as was the original Bickham work. Instead they furnish a compendium of the surgery of the alimentary tract, which is comprehensive in its information of the etiology, pathology, symptoms, physical findings, differential diagnosis, operative treatment, anesthesia, postoperative care, results and complications of the various conditions to which this important part of our anatomy is subject.

It should be pointed out that this work is not a revision of another work. The text is all Dr. Shackelford's. The only way in which it could be called a revision is that he did borow some of the illustrations from Bickham and from Callander, as well as from other sources.

The three volumes are highly recommended as a reference work for every medical library, and every surgeon's bookshelves would be more complete if they were graced by them. They are a *sine qua non* for those surgeons who operate rarely, or not too frequently, upon the alimentary tract.

AMOS R. KOONTZ, M.D., F.A.C.S.

THE HYPOPHYSEAL GROWTH HORMONE, NATURE AND ACTION. International Symposium edited by Richmond W. Smith, Jr., M.D., Oliver H. Gaebler, M.D., and C. N. H. Long, M.D., 576 pages, illustrated. The Blakiston Division, McGraw-Hill Company, Inc., New York, Toronto and London. 1955. Price $12.00.

This book is the complete proceedings of an international symposium in which forty-six research workers took part. The symposium was sponsored by the Henry Ford Hospital and the Edsel B. Ford Institute for Medical Research in October 1954. Complete recordings of the proceedings were edited by the three men listed above and were organized into five sections.

It was thirty-three years ago that the growth-promoting activity in the anterior hypophysis was first detected. Much research has been done in the last third of a century on this subject, although as this conference revealed, there is little at the present to encourage the idea that growth hormone will be of usefulness in clinical medicine. The hormone, nevertheless, can not be ignored. As stated in the introduction. "This symposium was held to sift over the rapidly accumulating data, to compare techniques of study, to attempt a resolution of disturbing differences, and to stimulate new approaches which someday may bring usefulness to this most intriguing pituitary substance."

This volume is obviously a very technical treatise of primary interest to the researcher. The general practitioner would find it rather dull reading. To anyone interested in endocrinology it would be a valuable addition to their library.

CDR. JAMES L. MCCARTNEY, (MC), USNR (Ret.)

THE CHEMISTRY OF MICRO-ORGANISMS. By Arthur Bracken, B.Sc., Ph.D., F.R.I.C. 343 pages. Pitman Publishing Company, New York, Toronto, and London. 1955. Price $6.00.

Based on a series of lectures on the metabolism of micro-organisms, the author found increasing interest on the part of scientists in various fields, and a peculiar lack of published, authentic reference material. This led to the production of this book, which discusses the role of enzymes, the metabolic activities of micro-organisms, their cultivation in nature and in factory-scale as well as laboratory-scale production. Attention is then directed to the production of pigments, colors, anabolism of sugars to aromatic com-

pounds, and to aliphatic and heterocyclic compounds. The importance of trace elements, also of sulphur and phosphorous in the growth of these organisms, and alternations produced by variation in Co and Mo are presented. The development of penicillin, streptomycin, chloramphenicol, and terramycin are used as examples of the general knowledge in the field. The final chapter deals with the importance of microorganisms in a changing world, and the necessity for further research for the development of new applications in industry as well as in medicine (such as the development of a microbiologically luminescent wall-paper to replace artificial lighting!).

Each chapter carries its own references. The organic chemistry underlying reactions is presented although not in detail. The metabolic pathways for inter-conversion of various materials is stressed. A 17-page index appears to be adequate for determining specific chemical or micro-biological information. This should prove a very useful reference book at this time for anyone interested in the background of developing and using microbial and antibiotic substances.

JAMES C. MUNCH, PH. D.

ANALYTICAL CYTOLOGY. Edited by Robert C. Mellors, M.D., Ph.D., Division of Experimental Pathology, Sloan-Kettering Institute for Cancer Research and Pathology Laboratories, Memorial Center for Cancer and Allied Diseases, and Graduate School for Medical Sciences, Cornell University Medical College. The Blakiston Division, McGraw-Hill Book Company, Inc., New York. 1955. Price $15.00.

This 511 page book consists of nine chapters each by different authors. A list of chapter titles with the respective authors will give some idea of the field covered and the quality of the authorship: "Cytophotometric Analysis in the Visible Spectrum" by Arthur W. Pollister, Ph.D. and Leonard Ornstein, M.A., Department of Zoology, Columbia University. "Histochemical and Cytochemical Staining Methods" by Alex B. Novikoff, Ph.D., Waldemar Medical Research Foundation. "Phase-Contrast, Interference Contrast, and Polarizing Microscopy", by Robert Barer, M.C., M.A., M.B., Oxford University, England. "Ultraviolet Microscopsy and Microspectroscopy", John I. Nurnberger, M.D., Yale University School of Medicine. "Fluorescence Microscopy", Oscar W. Richards, Ph.D., American Optical Company. "The Electron Microscopy of Tissue Cells", Cecily Cannan Selby, Ph.D., The Sloan-Kettering Institute for Cancer Research. "Radioautography—Its Use in Cytology", at New York City. "Historadiography", Arne Engström, Karolinska Institutet, Stockholm, Sweden. "X-ray Diffraction Techniques and Their Application to the Study of Biomolecular Structures", Gerald Oster, Ph.D., Polytechnic Institute of Brooklyn.

The authors of the first chapter list three different fields of possible application of visible cytophotometric analysis, namely, (a) the objective comparison of tests and stains as a means of standardization of methods, (b) as a means of making quantitative chemical estimations within the cell as for example the content of desoxypentose nucleic acid based on the Feulgen reaction, and (c) to obtain some insight into the nature of intra-cellular chemical complexes and molecular structure through absorption-curve analysis.

Chapter 2 includes descriptions of staining methods for nucleic acids, polysaccharides, plasmalogens, cholesterol and phospholipid, arginine, tyrosine, tryptophane and for various enzymes such as the phosphotases.

Phase-contrast microscopy is referred to in Chapter 3 as "the most valuable single method at the disposal of the cytologist interested in studying living material." Increasing use of phase-contrast methods has led to development of interference-contrast microscopy. Phase-contrast is actually one of the varieties of interference-contrast. Six methods of interference-contrast are described and a description is given of a method for determining cell mass by interference microscopy.

The pages devoted to microscopy with polarized light emphasize the use of this method in studying the mitotic spindle.

Ultraviolet microabsorption techniques are described as resulting in a new science of quantitative cytochemistry especially with reference to nucleic acids.

The average medical microscopist will find the chapter on fluorescence microscopy less difficult to read and understand than some of the other sections of the book. Some of the various uses of fluorescence microscopy are (1) recognition of atabrine in tissues, (2) identification of elements in ashed material, (3) the localization of vitamin "A" in tissues, (4) the recognition of acid-fast bacilli, and (5) the study of virus particles.

The chapter on electron microscopy is also readily understood without a background in

physics and mathematics. The author reviews electron-microscopical studies concerned with the histology of various tissues and of individual cells.

Radioautography involves the use of radioisotopes which localize in certain cells, such as I^{131} in the thyroid. The tissue containing the radioisotope is placed against a photographic emulsion and an image of the radioactive area results. After photographic processing the film may be studied directly or with a microscope. The technique is clearly described and applications of the method are listed.

Historadiography is based on the fact that absorption of x-rays in matter follows clear-cut laws and can be used as a means of chemical analysis of tissues or cells. A tissue section is placed in contact with a photographic emulsion and "x-rayed." This section also mentions briefly the x-ray microscope.

The last chapter discusses the use of x-ray diffraction techniques in the study of the molecular structure of biological material. All forms of matter scatter x-rays and from the diffraction pattern the structure of the material can be deduced. The method has been used chiefly in the study of the structure of proteins.

The methods and techniques described in this book indicate the great advances made in the field of microscopy in recent years. These methods are so new that their possibilities are as yet poorly understood. Opportunities for significant advances using these new tools appear very promising.

This book is not for the novice. It contains much theory and little practice. A knowledge of physics and mathematics is essential for complete understanding of much of the discussion.

As a reference book for the student of modern microscopy it should prove invaluable.

COL. HUGH R. GILMORE, JR., MC, USA

ANGIOGRAPHIC LOCALIZATION OF INTRACRANIAL MASSES. By Arthur Ecker, M.D., Ph.D., and Paul A. Riemenschneider, M.D., State University of New York. 433 pages, illustrated. Charles C Thomas, Springfield, Illinois. 1955. Price $13.50.

In 1951 the senior author brought out the first American monograph on cerebral angiography, and this present book, a practical, working atlas, is a worthy sequel to it. It is a reference manual, to be used in the daily work of performing angiography and in interpreting the results, and this reviewer believes it would be a useful tool in the hands of all neurosurgeons and of those roentgenologists who interpret angiograms. Using 27 specific locations for vascular displacement and malformation, the authors demonstrate, by line drawings, untouched halftones of angiograms, specific case histories, and a terse text, all the variations which in their large series they have found to lead to a diagnosis of intracranial space-occupying lesions on the basis of vascular displacement. They make a point of studying venograms as well as arteriograms. It is interesting to note that they now use the open "cut-down" method for all their studies, finding that the images of the vessels are much more clear-cut than they are by the percutaneous method, and that the interpretation of the pictures is therefore much more likely to be accurate. They tell nothing of their technique of injection otherwise, and, unfortunately, for this day of often unwisely and unwell performance of angiography, they do not discuss the dangers, complications and contraindications of the test. This book should do much to take the uncertainty out of angiographic interpretation, and to put the procedure on a scientfic, intellectual plane rather than a routine often haphazard one.

COL. JOHN MARTIN, MC, USA

ANTIMICROBIAL THERAPY IN MEDICAL PRACTICE. By Harrison F. Flippin, M.D., F.A.C.P., Associate Professor of Clinical Microbiology, The Graduate School of Medicine, The University of Pennsylvania; and George M. Eisenberg, D.SC., Chief, Division of Bacteriology and Immunology, Department of Laboratories, Philadelphia General Hospital (Blockley Division). 304 pages. F. A. Davis Company, Philadelphia, Pennsylvania. 1955. Price $5.50.

This report on Antimicrobial Therapy in Medical Practice is based on seventeen years of clinical and laboratory experience at the Philadelphia General Hospital. It presents a thorough, excellent and practical coverage of a vital subject.

The pharmacology of antimicrobial agents is well-delineated and their toxicology described. Antimicrobial combinations and adjuvants are presented primarily from their laboratory *in vitro* aspects. Early and correct diagnosis of infectious diseases before the clinical application of antibiotics is stressed. The chapter on complications of antimicro-

bial therapy deserves special emphasis, as noted in the excellent Foreword by Dr. Richard A. Kern, Professor and Head of the Department of Medicine, Temple University School of Medicine.

The second portion of the text is devoted to a definitive discussion of antimicrobial therapy of specific infectious diseases caused by the viruses, the pyogens, the organisms producing exotoxins, the spirochetal diseases, and infections of unknown etiology.

The prophylactic use of antimicrobial agents is presented with a word of caution as is the problem of antimicrobial resistance developing in various strains of organisms. The authors strongly recommend that antibiotics not be used to the exclusion or neglect of other proven forms of therapy.

The third section of the book is composed of a therapeutic index listing twenty or more antimicrobial agents and antibiotics in various combinations. The trade names of pharmaceutical manufacturers are given for each product for accurate identification.

The text contains many valuable tables based on practical laboratory evidence and clinical experience, omitting theoretical discussions and therapeutic confusions.

The antibiotics are potent weapons but, in unskilled hands, they are dangerous and therefore should not be employed in the treatment of minor ailments. Because of the danger of bacterial resistance to any or all antibiotics, or combinations thereof, these drugs should be used with caution, as stated by Fleming, and they should not be abused. The wholesale administration of antimicrobial drugs as prophylactic agents to prevent disease is soundly condemned, for as so aptly put by Sir William Osler: "One of the first duties of the physician is to educate the masses not to take medicine."

CAPT. CHRISTOPHER C. SHAW,
MC, USN

WELTRAUMSTRAHLUNG. (In German) By J. Eugster, Priv. Dozent, University of Zurich, Switzerland. Co-authors: H. Waffler, Prof. of Physics, University of Zurich; H. J. Schaefer, Nav. School of Aviation Medicine, Pensacola, Florida; L. Jenny, Abt. Vorstehere, Physical Chemistry, University of Basel; Hans Huber, Bern, Switzerland. In USA: Intercontinental Medical Book Corp. 381 Fourth Ave., New York 16, N.Y. 1955.

This slim book of 141 pages provides a wealth of information, thoroughly documented with quotations, relating to research, past and present in the field of cosmic radiation. Consideration is given in large measure to the physics involved which is in turn related to extensive biological research. This latter has become of increasing importance in recent years by reason of flights at extreme altitudes and speculations about interplanetary travel.

Observations have been made by means of balloons, rockets, and also on high mountains. They have been made too, at great depths in tunnels (Simidu in Japan and the Simplon tunnel through the Alps) and also under the sea.

Some interesting figures on the radiation at high altitudes are given. Radiation there consists largely of atomic nuclei with energies reaching such extremes as 10^{18}-10^{19}, e.v. The nuclei concerned are about as follows:

Protons (hydrogen nuclei)	79%	
He (alpha particles)	20%	
Heavier elements	1%	—various elements including Fe and Sn detected

The resultant dosage is considered comparable to that from a microgram of Radium with a 1.5 hour flight resulting in the customary tolerance dose. Haber in "The Human Body in Space" is quoted as giving the figure of 25 × the maximum permissible dose of radiation for the altitude of 80,000 feet. This would bespeak something like 1.1 r per day if we figure from the customary maximum permissible dose of 0.3 r per week. Such an amount would not be prohibitively restrictive for ordinary flights in the stratosphere of limited duration and frequency. However, a person exposed indefinitely would obviously accumulate far too much unless some practical means of protection could be employed.

In the matter of theory the reasons for great penetration of certain components or derivates of cosmic rays are explored and much interesting speculation recorded, some of them involving "neutrinos;" also a mesoneutretto. In general absorption in the earth does not follow an exponential law and penetration appears due largely to neutral mu/μ mesons.

Biological studies are noted and recorded involving the familiar fruit fly (Drosophila), various ova, enzymes; also dyestuffs. There is interesting speculation on the possible role of cosmic radiation as a factor in

the background of malignant tumor formation, and the matter is considered worthy of further clarification. Studies with carcinogenic agents in an environment subject to little or no radiation are suggested.

In conclusion it can be said that this book provides a very useful compendium and extensive bibliography on cosmic radiation research. As such it is well worthy of inclusion in scientific libraries. For the nonspecialist reader the value of the book would be enhanced by one or more chapters devoted to describing and clarifying the general background of the subject.

REAR ADM. C. F. BEHRENS, MC, USN

EXPERIENCING THE PATIENT'S DAY. A Manual for Psychiatric Hospital Personnel. By Robert W. Hyde, M.D., in collaboration with the Attendants of Boston Psychopathic Hospital. 214 pages. G. P. Putnam's Sons, New York. 1955. Price $2.20.

In the feverish accumulation of psychiatric knowledge, the traditional emphasis has been placed on the doctor-patient, and the nurse-patient relationships. Insufficient cognizance had been paid to the role of the psychiatric attendants in the care of the mentally ill. "With an average of one doctor to 348 patients, one nurse to 62 patients, and one attendant to 9 patients, it is evident that it is the attendants, who are working most directly with the patients, caring for their hour by hour needs, and most directly influencing their outcome." Appreciative of these crucial facts, Doctor Hyde has with great care prepared an excellent manual for psychiatric hospital personnel.

In no sense, is this work a textbook of current psychiatric knowledge. As the title indicates, *Experiencing the Patient's Day,* is an endeavor to furnish the psychiatric attendant with a living understanding of the patient's illness, and the problems involved in his care. As Doctor Hyde indicates, it is only through the sincere identification of attendant with patient, that the attendant is able to understand the communications of the mentally disturbed patient, and in turn, effectively communicate with the patient.

Doctor Hyde is eminently successful in realizing these fundamental objectives of his book. Within the inherent limitations set forth by any such book, the author thoroughly deals with the obvious everyday commonplaces of patient care, as well as its subtle intricacies. Most important of all, is the fact that this is done at the attendant's level. Everything is explained in simple, meaningful terms. The author's utilization of group discussions, with questions and answers by various members of the psychiatric team, is a further attempt to clarify the material, and orient it to the practical needs of the psychiatric attendant.

Also included within the manual are the various forms of clinical and laboratory examinations; the different types of treatment, somatic and otherwise; the diagnostic categories, with their characteristic symptoms and clinical pictures; and the special patient and ward problems encountered by the psychiatric attendant.

It is our feeling that this book will be exceptionally valuable for the training of psychiatric hospital personnel. Furthermore, it will offer a refreshing and useful perspective to the professional members of the psychiatric team.

CAPT. JESSIE E. CRAWFORD, ANC

SURGERY OF FACE, MOUTH, AND JAWS. By Frank McDowell, M.D., Assistant Professor of Clinical Surgery, Washington University School of Medicine and Associate Professor of Maxillofacial Surgery, Washington University School of Dentistry; James Barrett Brown, M.D., Professor of Clinical Surgery, Washington University School of Medicine and Professor of Maxillofacial Surgery, Washington University School of Dentistry; and Minot P. Fryer, M.D., Assistant Professor of Clinical Surgery, Washington University School of Medicine and Assistant Professor of Maxillofacial Surgery, Washington University School of Dentistry. 213 pages with 168 illustrations. The C. V. Mosby Company, St. Louis. 1954. Price $6.50.

This is a publication in monograph form, with preliminary matter and index added, of material previously published in Lewis-Walters' *Practice of Surgery* by the W. F. Prior Company, Inc. It is a concise, interestingly written volume.

It is felt that this book constitutes a highly valuable source of knowledge and information developed and otherwise accumulated by a team of skilled surgeons and teachers over a period of years. Their significant contributions make this volume an important addition to the library of anyone engaged in the field of oral, maxillofacial or plastic surgery. It is felt, however, that the volume might have been improved had the authors nar-

rowed their scope of coverage by giving more attention to their own contributions to surgical knowledge and less to so many aspects which are more adequately covered in other texts. Another possible shortcoming is the absence of a bibliography, which would be especially helpful for reference work to supplement the information in a text so concisely written as this one is. References in this volume are limited to articles written in surgical journals by the authors.

Techniques and surgical procedures described are limited largely to those advocated and used by the authors. As with other fields of medical or surgical care of patients there are differences of opinion as to procedures of choice. Among possible sources of difference of opinion with other recognized authorities are the advocation of routine avoidance of extraction of teeth involved in acute infection, the use of direct interdental wiring as the method of choice for intermaxillary wiring for immobilizing fractured jaws, the frequent use of direct Kirschner wire fixation for jaw fractures, etc. For these reasons, although this text is recommended as a valuable addition to the library of anyone engaged in any of these closely related fields of surgery, its use is recommended more as a supplement to other material than as the principal source of information in these fields.

Lt. Col. Russell W. Sumnicht, DC, USA

The Skin. A Clinicopathologic Treatise. By Arthur C. Allen, M.D., Associate Pathologist, Memorial Hospital; Associate Attending Pathologist, Memorial Cancer Center, New York City; Associate Professor of Pathology, Cornell University Medical School, Sloan-Kettering Division. 1048 pages, with 495 full-page illustrations. C. V. Mosby Co., St. Louis. 1954. Price $25.00.

This book was prepared by a pathologist who stated that it is intended for dermatologists as well as the great many other physicians who encounter skin disorders in their practice and foremost among the author's aims is his desire to interest his fellow pathologists in the field of cutaneous diseases, thereby enhancing their usefulness to dermatologists and other clinicians and, hence, to patients.

The author properly chastises dermatology for its inadequacies in regard to the complex, often unwieldy nomenclature, that is not easily transmissible to colleagues; splintering into separate entities disorders that are essentially the same; clarification of the criteria of histologic diagnosis; integrating cutaneous and visceral manifestations and pathology with a better classification of cutaneous disease; and above all reducing the barriers between dermatology and other disciplines. It was to better this conjunction between dermatologists and other practitioners of medicine that the addition of this book was felt justified.

In the discussion on the erythemas, which appear to be covered rather thoroughly, he points out that this is yet another example of the discouraging, redundant, dispensable nomenclature but points out that there is the possibility that differences in configuration of individual lesions may one day be found to reflect categorical differences in causation and mode of production. A proper point that is frequently brought up is the great variety of names used in the classification of a number of diseases; in various synonyms to designate the same condition. The author makes a moderate attempt in a number of areas to describe and reduce the terms for the specific descriptions of a number of diseases; as for example in the descriptions of tuberculosis and related diseases of the skin. Some of the classifications could well have been simplified or corrected. An example being Leprosy, where the author uses the older classification. The more acceptable classification today is that supported by the International Congress on Leprosy. He even mentions that chaulmoogra oil is continuing as therapy when actually this has been displaced by the sulfones.

In discussing the therapy of syphilis the impression is given that the Wassermann test is the criterion of cure so that its negativity indicates the cure of syphilis. Many patients who have been thoroughly and adequately treated have persistent positive Wassermann tests in both congenital and acquired syphilis. There is a picture of trichophytosis with discoloration of the nails. The discoloration is propably due to treatment of the foot with potassium permanganate solution and not, as inferred, due to the trichophytosis as such.

The chapter on Psychocutaneous Disorders is unusually good and covers the subject more appropriately than the average text. He makes a statement that effacement of tattoos by abrasive therapy has been only partially successful. This is in disagreement with actuality, for when abrasive therapy is car-

ried out carefully any type of tattoo can be either improved or thoroughly removed, depending upon the skill and care of the operator.

There is a great deal of space devoted to discussion, diagnosis, and interpretation of the clinical and histopathologic picture of tumors of the skin. This discussion is extensive, multiphasic and very often provocative and contrary to old accepted notions.

The author has done well by his statement that "It is not our purpose to prolong the polemics regarding the terminologic frills that are commonly appended to a discussion." The definitions of many conditions are often excellently elaborated. The book is printed on large sized pages and very well laid out. The photographs are excellent and are ordinarily clear and well selected. The histologic pictures are in general quite characteristic and support the text material very well. It is thoroughly indexed, with numerous subheadings for the various topics.

It is recommended as a good reference source and has concepts that could be readily accepted by any dermatologist or pathologist, as well as other practitioners of medicine.

ROBERT STOLAR

DIFFERENTIAL DIAGNOSIS. The Interpretation of Clinical Evidence. By A. McGehee Harvey, M.D., Professor of Medicine and Head of the Department of Internal Medicine, The Johns Hopkins University School of Medicine; and James Bordley III, M.D., Clinical Professor of Medicine, Columbia University, New York. 665 pages. W. B. Saunders Company, Philadelphia and London. 1955. Price $11.00.

In their provocative introduction to this excellent volume, the authors define the word, "diagnosis," and describe the various forms of usage of this term from the days of the early Greek physicians through the 17th and 18th centuries to the middle of the 20th century. The original connotation of the Greek word "diagnosis" was "to distinguish or discern"; hence, a thorough knowledge of the disease entity and its concept. In modern usage, diagnosis may be considered "identification of disease by investigation of its signs and symptoms." Two methods of current teaching have removed the subject of differential diagnosis from the realm of dogma. These are the bedside clinic and the clinical-pathological conference.

This book is based upon experience with such teaching methods at the Johns Hopkins Hospital (and elsewhere) over the past two decades. It provides a rational and logical approach to the problem of differential diagnosis by means of a series of clinical-pathological exercises which expound sound methods of clinical reasoning from the bedside to the necropsy table, and conversely.

This book is divided into fourteen chapters of which the first thirteen are devoted to an analysis of signs and symptoms of disease entities attacking various organ-systems. The fourteenth chapter is entitled "Unknown Cases for Study" to afford the reader an opportunity to make his own analysis of the case and check his clinical acumen against the anatomical diagnosis.

In addition, there is a special index of symptoms, signs and laboratory findings together with a brief table of laboratory values of clinical importance in the normal human adult.

This reviewer is favorably impressed with the teaching value of this volume which should find prompt response in the third and fourth years of medical school and during the house-officer period of postgraduate training. The section on *Fever of Obscure Origin* should do much to sharpen the clinical-pathological integration of the general practitioner and internist. This book deserves a place of prominence in the active library of every physician interested in the intellectual challenge of differential diagnosis, which is "the art of distinguishing one disease from another."

CAPT. CHRISTOPHER C. SHAW, MC, USN

PERIPHERAL NERVE INJURIES. By the Nerve Injuries Committee of the Medical Research Council (ed.: H. J. Seddon). Medical Research Council Special Report Series, No. 282. London, Her Majesty's Stationery Office, 1954. 451 pages, 276 figures, 122 tables. Price £2 15s.

Britain's experts in peripheral nerve injuries have collaborated in bringing together an extraordinary amount of up-to-date information on all aspects of the field: methods of investigating nerve injuries (by H. J. Seddon), rates of regenerations (by R. E. M. Bowden and D. A. School), vasomotor and nutritional disorders following injuries to peripheral nerves (by R. L. Richards), lesions in continuity (by R. B. Zachary and R. Roaf), nerve injuries and fractures (by D. M. Brooks), histopathology of nerve injury (by W. Blackwood and W. Holmes), histopathology of nerve grafts (by F. K. Sanders), causalgia—a review of 48 cases (by R. Barnes), neurovascular lesions (by

R. L. Richards), electrical diagnosis (by A. E. Ritchie), electromyography (by R. E. M. Bowden), factors influencing functional recovery (by R. E. M. Bowden), results of nerve suture (by R. B. Zachary), nerve grafting and other unusual forms of nerve repair (by H. J. Seddon), and open wounds of the brachial plexus (by D. M. Brooks).

For all this, the book remains relatively short, mainly because of frequent resort to tabulation. Ample details are given to make the book of practical use, for example in the chapter on methods of investigating nerve injuries. The works of Sunderland and his associates are given due attention; the older Greek classification, however, still takes precedence over Sunderland's newer one based on degree of pathological change. Histopathology is very well handled and, as elsewhere in the text, the illustrations are excellent.

The foregoing is intended as an announcement, not a review. The book is unique. All aspects are masterfully written. Anyone interested in the peripheral nervous system will want to have it available.

WEBB HAYMAKER, M.D.

NEW BOOKS

Blood Supply and Anatomy of the Upper Abdominal Organs, with a Descriptive Atlas, by Nicholas A. Michels, M.A.D.Sc. (Louvain). J. B. Lippincott Co., Philadelphia, Pa. Price $24.00.

Congreso Venezolano de Cirurgia. 2d Congress (15-21 March, 1953) Relatos Oficiales y Correlatos. Vol. 1. 794 p. Caracas, Imprenta Nacional, 1955.

The Pharmacopeia of the United States of America. Fifteenth Revision. Mack Publishing Co., Easton, Pa. Price $10.00.

Ageing-General Aspects, Ciba Foundation Colloquia on Ageing, Vol. I., edited by G. E. W. Wolstenholme, O. B. E. and Margaret P. Cameron, M. A. Little, Brown & Co., Boston, Mass. 1955. Price $6.75.

Denial of Illness, by Edwin A. Weinstein, M.D. and Robert L. Kahn, Ph.D. Charles C Thomas, Publisher, Springfield, Ill. Price $4.75.

Transplantation of Tissues, Vol. 1. Cartilage, Bone, Fascia, Tendon, and Muscle, by Lyndon A. Peer, M.D. The Williams & Wilkins Co., Baltimore, Md. Price $13.50.

Communicable Diseases, 3rd ed. by Franklin H. Top, A.B., M.D., M.P.H., F.A.C.P., F.A.A.P., F.A.P.H.A., and collaborators. The C. V. Mosby Co., St. Louis, Mo. Price $18.50.

New and Non-Official Remedies, 1955. J. B. Lippincott Co., Phila., Pa. Price $3.35.

The Physiology of Domestic Animals, by H. H. Dukes, D.V.M., M.S. Cornell University Press, Ithaca, N.Y. Price $9.75.

Oxygenotherapie, by Leon Binet and Madeleine Bochet. Masson et Cie. Paris, France. Price 1.300 fr.

Clinical Biochemistry, by Abraham Cantarow, M.D. and Max Trumper, Ph.D. W. B. Saunders Co., Philadelphia, Pa. Price $9.00.

Systemic Association and Treatment of Skin Diseases, by Kurt Wiener, M.D. The C. V. Mosby Co., St. Louis, Mo. Price $17.00.

Portrait of Patton, by Harry N. Semmes. Appleton-Century-Crofts, 1955. Price $6.00.

Laboratory Identification of Pathogenic Fungi Simplified, by Elizabeth L. Hazen, Ph.D. and Frank Curtis Reed. Charles C Thomas, Publisher, Springfield, Ill. Price $5.50.

Anxiety and Stress, by Harold Basowitz, Sheldon J. Korchin, Harold Persky, and Roy R. Grinker. The Blakiston Division, McGraw-Hill Book Co., New York, N.Y. Price $8.00.

Survey of Clinical Pediatrics, by Lawrence B. Slobody, M.D. The Blakiston Division, McGraw-Hill Book Co., New York, N.Y. Price $9.50.

Physiology and Anatomy, with Practical Applications, by Esther M. Greisheimer, Ph.D., M.D. J. B. Lippincott Co., Philadelphia, Pa. Price $5.00.

The Biologic Effects of Tobacco, edited by Ernest L. Wynder, M.D. Little, Brown & Co., Boston, Mass. Price $4.50.

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